Module Handbook
Economathematics (M.Sc.)

SPO 2009/2016
Winter term 18/19
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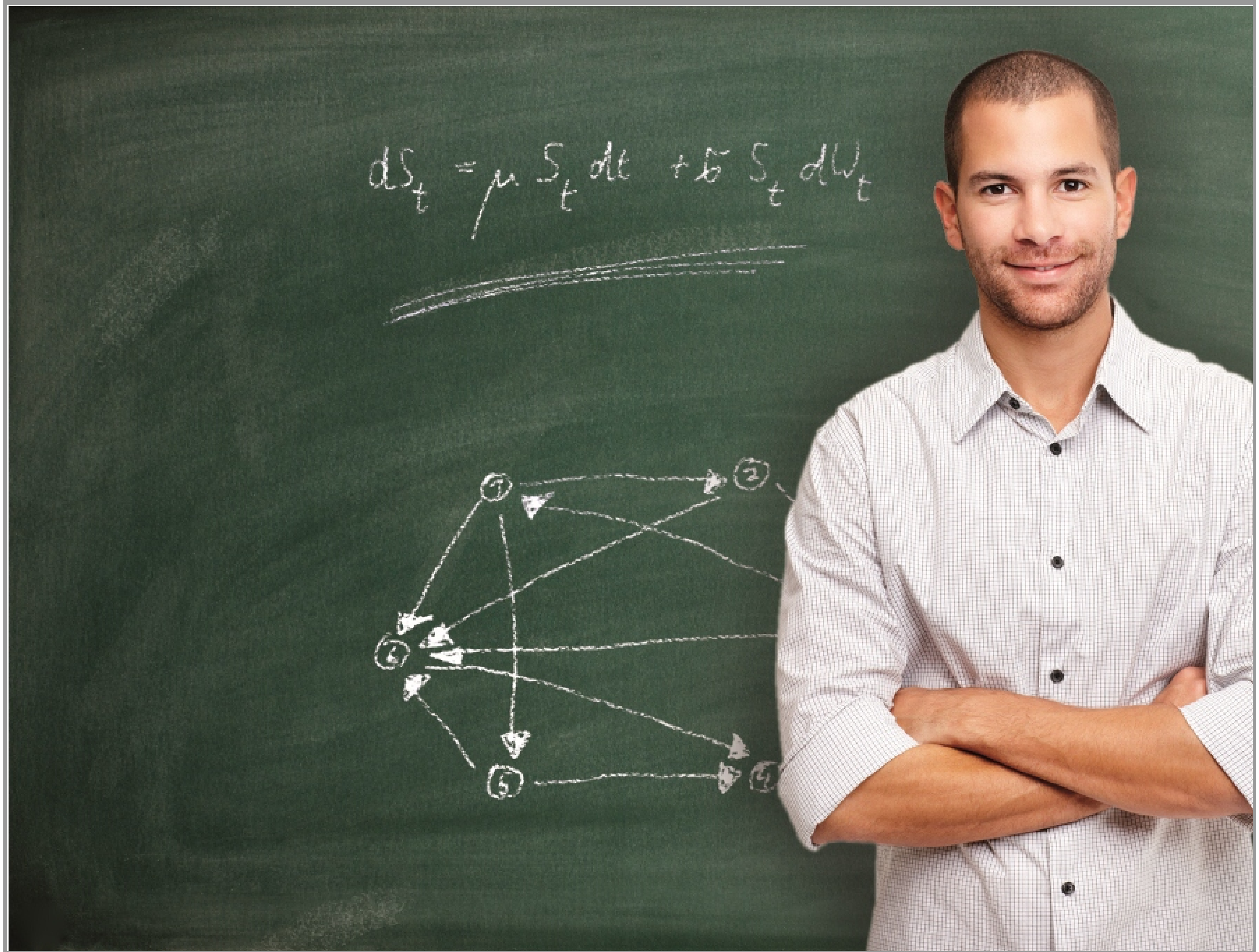
KIT Department of Economics and Management / KIT Department of Mathematics



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Part I
About this handbook

1 Notes and rules

The program exists of several **subjects** (e.g. business administration, economics, operations research). Every subject is split into **modules** and every module itself consists of one or more interrelated **module component exams**. The extent of every module is indicated by credit points (CP), which will be credited after the successful completion of the module. Some of the modules are **obligatory**. According to the interdisciplinary character of the program, a great variety of **individual specialization and deepening possibilities** exists for a large number of modules. This enables the student to customize content and time schedule of the program according to personal needs, interest and job perspective. The **module handbook** describes the modules belonging to the program. It describes particularly:

- the structure of the modules
- the extent (in CP),
- the dependencies of the modules,
- the learning outcomes,
- the assessment and examinations.

The module handbook serves as a necessary orientation and as a helpful guide throughout the studies. The module handbook does not replace the **course catalog**, which provides important information concerning each semester and variable course details (e.g. time and location of the course).

Begin and completion of a module

Each module and each examination can only be selected once. The decision on the assignment of an examination to a module (if, for example, an examination in several modules is selectable) is made by the student at the moment when he / she is registered for the appropriate examination. A module is completed or passed when the module examination is passed (grade 4.0 or better). For modules in which the module examination is carried out over several partial examinations, the following applies: The module is completed when all necessary module partial examinations have been passed. In the case of modules which offer alternative partial examinations, the module examination is concluded with the examination with which the required total credit points are reached or exceeded. The module grade, however, is combined with the weight of the predefined credit points for the module in the overall grade calculation.

Module versions

It is not uncommon for modules to be revised due to, for example, new courses or cancelled examinations. As a rule, a new module version is created, which applies to all students who are new to the module. On the other hand, students who have already started the module enjoy confidence and remain in the old module version. These students can complete the module on the same conditions as at the beginning of the module (exceptions are regulated by the examination committee). The date of the student's "'binding declaration"' on the choice of the module in the sense of §5(2) of the Study and Examination Regulation is decisive. This binding declaration is made by registering for the first examination in this module.
In the module handbook, all modules are presented in their current version. The version number is given in the module description. Older module versions can be accessed via the previous module handbooks in the archive at http://www.wiwi.kit.edu/Archiv_MHB.php.

General and partial examinations

Module examinations can be either taken in a general examination or in partial examinations. If the module examination is offered as a general examination, the entire learning content of the module will be examined in a single examamination. If the module examination is subdivided into partial examinations, the content of each course will be examined in corresponding partial examinations. Registration for examinations can be done online at the campus management portal. The following functions can be accessed on
https://campus.studium.kit.edu/exams/index.php:

- Register/unregister for examinations
- Check for examination results
- Create transcript of records

For further and more detailed information, see https://studium.kit.edu/Seiten/FAQ.aspx.

Types of exams

Following **SPO 2015** exams are split into written exams, oral exams and alternative exam assessments. Exams are always graded. Non exam assessments can be repeated several times and are not graded. According to **SPO 2007/2009** exams are split into written exams, oral exams and non exam assessments. Non exam assessments are graded or not.

Repeating exams

Principally, a failed written exam, oral exam or alternative exam assessment can repeated only once. If the repeat examination (including an eventually provided verbal repeat examination) will be failed as well, the examination claim is lost. A request for a second repetition has to be made in written form to the examination committee two months after loosing the examination claim. A counseling interview is mandatory.
For further information see http://www.wiwi.kit.edu/hinweiseZweitwdh.php.

Additional accomplishments

Additional accomplishments are voluntarily taken exams, which have no impact on the overall grade of the student and can take place on the level of single courses or on entire modules. It is also mandatory to declare an additional accomplishment as such at the time of registration for an exam. Additional accomplishments with at most 30 CP may appear additionally in the certificate.

Further information

More detailed information about the legal and general conditions of the program can be found in the examination regulation of the program (http://www.sle.kit.edu/amtlicheBekanntmachungen.php).

2 Online Version

A new webbased version of the module handbook is now available. This online handbook offers more comfort in browsing modules and courses and allows a smart switching between the english and german version. Try it out!

- Industrial Engineering and Management (B.Sc.): http://www.wiwi.kit.edu/english/mhbWiingBsc_en.php
- Industrial Engineering and Management (M.Sc.): http://www.wiwi.kit.edu/english/mhbWiingMsc_en.php
- Economics Engineering (B.Sc.): http://www.wiwi.kit.edu/english/mhbTVWLBsc_eng.php
- Economics Engineering (M.Sc.): http://www.wiwi.kit.edu/english/mhbTVWLMsc_en.php
- Information Engineering and Management (B.Sc.): http://www.wiwi.kit.edu/english/mhbInwiBsc_en.php
- Information Engineering and Management (M.Sc.): http://www.wiwi.kit.edu/english/mhbInwiMsc_en.php
- Economathematics (M.Sc.): http://www.wiwi.kit.edu/english/mhbWimaMsc_en.php

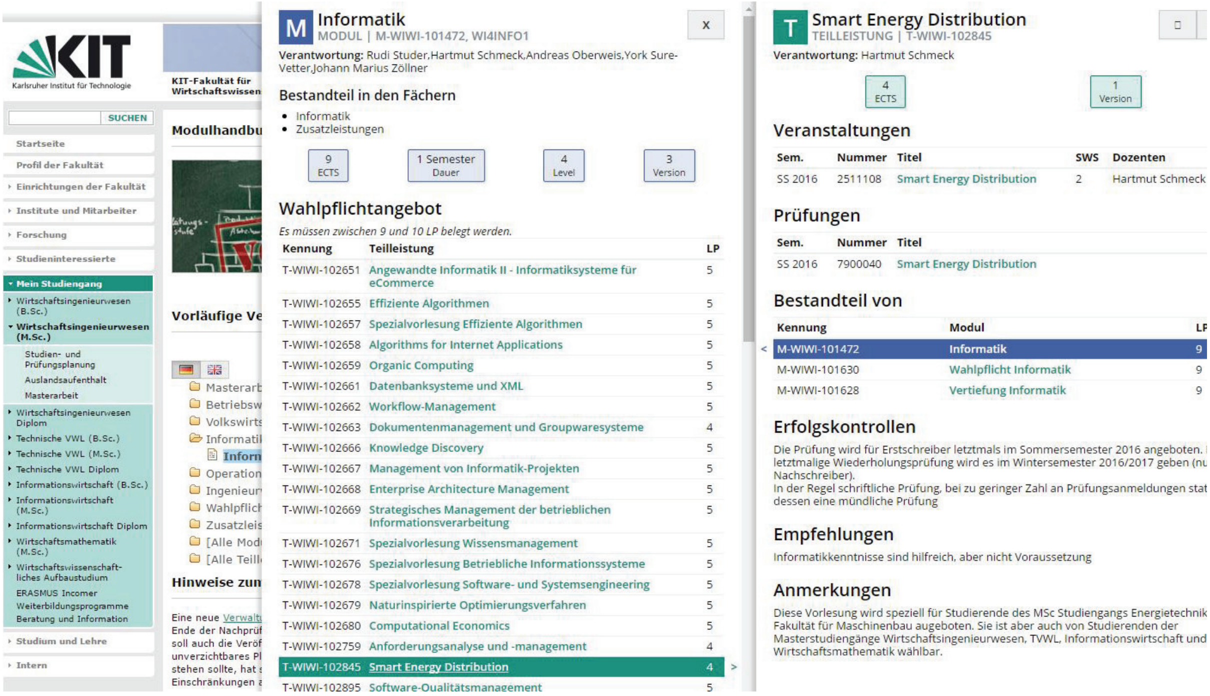

Figure 1: Screenshot of the webbased module handbook

3 Contact

If you have any questions about modules or exams with **WIWI**-ID, please contact the examination office of the KIT Department of Economics and Management:

Ralf Hilser
Anabela Relvas
Phone +49 721 608-43768
E-Mail: pruefungssekretariat@wiwi.kit.edu

If you have any questions about modules or exams with **MATH**-ID, please contact at the KIT Department of Mathematics:

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Part II
The Master's degree program in Economathematics

1 Study plan according to SPO 2016

Preface

This study plan is intended to supplement and explain the study and examination regulations of the Master's degree program in Economathematics, and to provide students with concrete examples of the organization of their studies.

1. Qualification objectives and profile of the degree program

The interdisciplinary Master's degree program in Economathematics provides the qualification for a professional activity in the areas of industry, banking, insurance, logistics, software development and research. Through the research-oriented training, the graduates are prepared especially for lifelong learning.

Professional key qualifications

Graduates have a broad knowledge of mathematical and economic sciences, including specific methods and techniques in the fields of analysis / numerics / optimization, stochastics, finance / risk management / managerial economics and operations management / data analysis / Informatics. They are able to analyze and explain current, complex questions in these fields. They can use methods from economics and mathematics, combine them and work interdisciplinarily. Based on these methods, they are able to handle practical and research-relevant questions. Graduates have trained analytical thinking and can work independently and reflectively. They are also able to acquire additional knowledge for further questions themselves.

Interdisciplinary qualifications

Graduates can analyze, evaluate and solve problems in new and unfamiliar situations in a multidisciplinary context. They are able to integrate their knowledge independently, deal with high complexity, and they have endurance in solving difficult problems. Graduates are capable of documenting, illustrating and interpreting results which have been obtained. They always take into account social, scientific and ethical conditions. They can argue and defend a position with experts as well as with laymen, on problems and solutions at a scientific level. In addition, they have the ability to work in a team and are able to use their knowledge effectively.

Learning outcomes

The graduates can name, explain and apply deepening mathematical methods in economics. They are also able to identify the application of these methods. The graduates have an understanding of economic processes and can comment on economic issues. They will gain an in-depth understanding of mathematical methods in the fields of analysis / numerics / optimization and stochastics.

2. Structure of the degree program

The courses are held in the form of modules, with most modules consisting of at least one course (with or without an exercise) or a seminar. Each module closes with a learning control. The average workload is measured in credit points (CP). In general, modules are graded. The grade is included in the final score. The master thesis consists of a separate module with 30 CP. In total, 120 credits must be earned in the Master's degree, approximately evenly distributed over four semesters.
The Master's degree in Economathematics is based on the two disciplines *mathematics* and *economics*, which are offered by the department of Mathematics and the department of Economics and Management. Modules from both disciplines must be selected as follows.

1. Subject: Mathematical Methods

There are the following four mathematical fields:

1. Stochastics
2. Applied and Numerical Mathematics / Optimization
3. Analysis
4. Algebra and Geometry

A minimum of 36 credits must be earned, with 8 credits from the field of Stochastics and 8 credits from one of the fields of Analysis or Applied and Numerical Mathematics / Optimization. The remaining credits must be obtained by any examination from the four mathematical fields. The modules belonging to these fields can be found in the module handbook.

2. Subject: Finance - Risk Management - Managerial Economics

18 CP must be aquired. The modules belonging to the three fields can be found in the module handbook.

3. Subject: Operations Management - Data Analysis - Informatics

18 CP must be aquired. The modules belonging to the three fields can be found in the module handbook.

Seminars

Furthermore, two seminar modules with 3 CP have to be taken. Precisely each one has to be chosen from the two disciplines mathematics and economics.

Elective subject

A further 12 credits are to be earned flexibly from the above-mentioned mathematical or economics modules or as a maximum of one seminar in economics. In particular, this gives the possibility of professional deepening in preparation for the Master Thesis. All modules in the elective subject must be graded.

Master Thesis

The master's thesis is usually written in the fourth semester and has 30 credits. Prerequisite for admission to the master's thesis module is that the student successfully completed module examinations of 70 credits. The master's thesis can be supervised in both participating departments and should, as far as possible, deal with a topic relevant to content and methodology for business mathematics / economathematics. A prerequisite is an appropriate deepening in the subject field of the work.

3. Key qualifications

Part of the degree program is also the acquisition of key and interdisciplinary qualifications. This field includes over-arching events on social topics, complementary scientific programs, the application of specialist knowledge in the field of work, competence training for the targeted training of soft skills as well as foreign language training in the scientific context.
The master's degree program in Economathematics at the Departments for Mathematics and Economics and Management is characterized by an exceptionally high degree of interdisciplinarity. With the combination of mathematical and economics subjects, the acquisition of knowledge from different disciplines is an integral part of the course. Interdisciplinary thinking in connections is thereby naturally promoted. In addition, the seminars of the Master's degree program contribute significantly to the promotion of the soft skills by the training of scientifically highly qualified editing and presentation of special topics.
The key competences integrally shared within the degree program can be assigned to the following fields:

Basic skills (soft skills)

1. Teamwork, social communication and creativity techniques (for example, working in small groups, working together on the homework and reworking the course material)
2. Presentation creation and techniques
3. Logical and systematic argumentation and writing (for example, in exercises, seminars, courses and writing homework)
4. Structured problem solving and communication

Practice orientation (enabling skills)

1. Empowerment in a professional context
2. Competences in project management
3. Business basic knowledge
4. English as a technical language

Orientation knowledge

1. Mediation of interdisciplinary knowledge
2. Institutional knowledge about economic and legal systems
3. Knowledge about international organizations
4. Media, technology and innovation

Courses that provide the necessary competencies are summarized in the module for key qualifications and are regularly updated in the relevant module description of the module handbook. This list is coordinated with the House of Competence.

4. Exemplary study courses

The following versions are just a few of the many options of available study courses.

Version 1

Semester 1: 30 CP, 5 examinations

Subject 1: Analysis 8 CP, Stochastics 8 CP, choice 5 CP = 21 CP
Subject 2: Finance 1 9 CP (SS) and Insurance Management I 9 CP (WS)

Semester 2: 28 CP, 6 examinations

Subject 1: Choice 6 CP + Choice 4 CP (or 5 + 5 or 7 + 5) = 10 CP
Subject 2: Finance 2 9 CP (WS) or Finance 1 (SS)
Subject 3: Informatics 9 CP

Semester 3: 32 CP, 6 examinations, 1 non exam assessment

Subject 1: choice 5 CP
Subject 3: Stochastic Methods and Simulation 9 CP
Subject 4: 3 CP (Seminar WiWi)
Subject 5: 3 CP (Seminar Math)
Optional compulsory: 8 CP + 4 CP (or other partitioning) = 12 CP

Semester 4: 30 CP

Master Thesis

Version 2

Semester 1: 33 CP, 5 examinations

Subject 1: Analysis 8 CP, Stochastics 8 CP, choice 8 CP = 24 CP
Subject 2: Finance 1 9 CP (SS) and Insurance Management I 9 CP (WS)

Semester 2: 30 CP, 6 examinations

Subject 1: Option 8 CP + choice 4 CP (or other partitioning like 6 + 6 or 7 + 5) = 12 CP
Subject 2: Finance 2 9 CP (WS) or Finance 1 (SS)
Subject 3: Informatics 9 CP

Semester 3: 27 CP, 5 examinations, 1 non exam assessment

Subject 3: Stochastic Methods and Simulation 9 CP
Subject 4: 3 CP (Seminar WiWi)
Subject 5: 3 CP (Seminar Math)
Optional: 8 CP + 4 CP (or other partitioning such as 6 + 6 or 7 + 5) = 12 CP

Semester 4: 30 CP

Master Thesis

Version 3

Semester 1: 30 CP, 5 examinations

Subject 1: Analysis 8 CP, Stochastics 8 CP, choice 5 CP = 21 CP
Subject 2: Finance 1 9 CP

Semester 2: 30 CP, 6 examinations, 1 non exam assessment

Subject 2: Finance 2 9 CP
Subject 3: Informatics 9 CP, Stochastic Methods and Simulation 9 CP = 18 CP
Subject 5: 3 CP (Seminar Math)

semester 3: 30 credits, 5 - 6 examinations (depending on denomination)

Subject 1: Option 15 CP (conceivable in various forms, for example 5 + 5 + 5, 8 + 7, 6 + 4 + 5)
Optional compulsory: 12 CP (e.g., 8 + 4 CP or 9 + 3 CP)
Subject 4: 3 CP (Seminar WiWi)

Semester 4: 30 CP

Master Thesis

Version 4: Start in summer term (with specific possible choices)

Semester 1: 29 CP, 5 examinations

Subject 1: Introduction to Scientific Computing (Numerics and Applied Mathematics) 8 CP, Financial Mathematics in Continuous Time (Stochastics) 8 CP, Time Series (Stochastics) 4 CP = 20 CP
Subject 2: Finance 1: Derivatives 4.5 CP, Asset Pricing 4.5 CP = 9 CP

Semester 2: 30 CP, 5 examinations

Subject 1: Functional Analysis (Analysis) 8 CP, Spatial Stochastics (Stochastics) (8 CP) = 16 CP
Subject 2: Finance 2: Fixed-income securities 4.5 CP, Credit Risks 4.5 CP = 9 CP
Subject 3: Informatics: Algorithms for Internet Applications 5 CP

Semester 3: 31 CP, 6 examinations, 1 non exam assessment

Subject 3: Informatics: Smart Energy Distribution 4 CP
Subject 3: Operations Research in Supply Chain Management and Healthcare Management: Tactical and Operational Supply Chain Management 4.5 CP + Event Discrete Simulation in Production and Logistics 4.5 CP = 9 CP
Subject 4: Seminar WiWi 3 CP (examination)
Subject 5: Seminar Math 3 CP (study performance)
Optional subject: Stochastic Geometry (Stochastics) 8 CP, Generalized Regression Models (Stochastics) 4 CP = 12 CP

Semester 4: 30 CP

Master Thesis

Version 5: Start in summer term (with specific possible choices)

Semester 1: 29 CP, 5 examinations

Subject 1: Introduction to Scientific Computing (Numerics and Applied Mathematics) 8 CP, Financial Mathematics in Continuous Time (Stochastics) 8 CP, Time Series (Stochastics) 4 CP = 20 CP
Subject 2: Finance 1: Derivatives 4.5 CP, Asset Pricing 4.5 CP = 9 CP

Semester 2: 33 CP, 5 examinations, 1 non exam assessment

Subject 1: Functional analysis (analysis) 8 CP, asymptotic stochastics (stochastics) 8 CP = 16 CP
Subject 2: Finance 2: Fixed-income securities 4.5 CP, credit risks 4.5 CP = 9 CP
Subject 3: Informatics: Algorithms for Internet Applications 5 CP
Subject 5: 3 CP (Seminar math) 3 CP (Study performance)

Semester 3: 28 CP, 6 examinations

Subject 3: Informatics: Smart Energy Distribution 4 CP
Subject 3: Operations Research in Supply Chain Management and Health Care Management: Tactical and Operational Supply Chain Management 4.5 CP + Event Discrete Simulation in Production and Logistics 4.5 CP = 9CP
Subject 4: Seminar WiWi 3 CP (examination)
Optional subject: boundary and eigenvalue problems (analysis) 8 CP, generalized regression models (stochastics) 4 CP = 12 CP

Semester 4: 30 CP

Master Thesis

Version 6: Start in winter term (with specific possible choices)

Semester 1: 31.5 CP, 5 examinations

Subject 1: Functional Analysis (Analysis) 8 CP, Financial Mathematics in Discrete Time (Stochastics) 8 CP, Algebra 8 CP = 24 CP
Subject 2: Finance 1: Valuation 4.5 CP
Subject 4: Seminar WiWi 3 CP

Semester 2: 32.5 CP, 6 examinations

Subject 1: Financial Mathematics in Continuous Time (Stochastics) 8 CP, Time Series (Stochastics) 4 CP = 12 CP
Subject 2: Finance 1: Derivatives 4.5 CP
Subject 3: Informatics: Document Management and Groupware Systems 4 CP
Scope: Boundary and eigenvalue problems 8 CP, Generalized regression models (stochastics) 4 CP = 12 CP

semester 3: 26 CP, 5 examination credits, 1 non exam assessment

Subject 2: Finance 2: Financial Intermediation 4.5 CP + eFinance: Information Management for Securities Trading 4.5 CP = 9 CP
Subject 3: Informatics: Algorithms for Internet Applications 5 CP
Subject 3: Operations Research in Supply Chain Management and Healthcare Management: Location Planning and Strategic Supply Chain Management 4.5 CP + Supply Chain Management in the Process Industry 4.5 CP = 9 CP
Subject 5: Seminar Math 3 CP

Semester 4: 30 CP

Master Thesis

Version 7: Start in winter term (with specific possible choices)

Semester 1: 31.5 CP, 5 examinations

Subject 1: Functional Analysis (Analysis) 8 CP, Financial Mathematics in Discrete Time (Stochastics) 8 CP, Algebra 8 CP = 24 CP
Subject 2: Finance 1: Valuation 4.5 CP
Subject 4: Seminar WiWi 3 CP

Semester 2: 32.5 CP, 6 examinations

Subject 1: Financial Mathematics in Continuous Time (Stochastics) 8 CP, Time Series (Stochastics) 4 CP = 12 CP
Subject 2: Finance 1: Derivatives 4.5 CP
Subject 3: Informatics: Document Management and Groupware Systems 4 CP
Compulsory subject: Introduction to scientific computing (numerics and applied mathematics) 8 CP, Generalized Regression Models (Stochastics) 4 CP = 12 CP

Semester 3: 26.5 CP, 5 examinations, 1 non exam assessment

Subject 2: Finance 2: Financial Intermediation 4.5 CP + eFinance: Information Management for Securities Trading 4.5 CP = 9 CP
Subject 3: Informatics: Algorithms for Internet Applications 5 CP
Subject 3: Operations Research in Supply Chain Management and Healthcare Management: Location Planning and Strategic Supply Chain Management 4.5 CP + Supply Chain Management in the Process Industry 4.5 CP = 9 CP
Subject 5: Seminar Math 3 CP

Semester 4: 30 CP

Master Thesis

Version 8: Start in winter term (with specific possible choices)

Semester 1: 31.5 CP, 5 examinations

Subject 1: Functional Analysis (Analysis) 8 CP, Financial Mathematics in Discrete Time (Stochastics) 8 CP, Algebra 8 CP = 24 CP
Subject 2: Finance 1: Valuation 4.5 CP
Subject 4: Seminar WiWi 3 CP

Semester 2: 29.5 CP, 6 examinations

Subject 1: Financial Mathematics in Continuous Time (Stochastics) 8 CP, Time Series (Stochastics) 4 CP = 12 CP
Subject 2: Finance 1: Derivatives 4.5 CP
Subject 3: Informatics: Document Management and Groupware Systems 4 CP + Efficient Algorithms 5 CP = 9 CP
Compulsory subject: Generalized regression models (stochastics) 4 CP

Semester 3: 29 CP, 5 examinations, 1 non exam assessment

Subject 2: Finance 2: Financial Intermediation 4.5 CP + eFinance: Information Management for Securities Trading 4.5 CP = 9 CP
Subject 3: Operations Research in Supply Chain Management: Graph Theory and Advanced Location Models 4.5 CP, Site Planning and Strategic Supply Chain Management 4.5 CP = 9 CP
Subject 5: Seminar Math 3 CP
Required field: differential geometry (algebra and geometry) 8 CP

Semester 4: 30 CP

Master Thesis

Version 9: Start in winter term (with specific possible choices)

Semester 1: 31.5 CP, 5 examinations

Subject 1: Functional Analysis (Analysis) 8 CP, Financial Mathematics in Discrete Time (Stochastics) 8 CP, Algebra 8 CP = 24 CP
Subject 2: Insurance Management I: Insurance Production 4.5 CP
Subject 4: Seminar WiWi 3 CP

Semester 2: 29.5 CP, 6 examinations

Subject 1: Financial Mathematics in Continuous Time (Stochastics) 8 CP, Time Series (Stochastics) 4 CP = 12 CP
Subject 2: Insurance Management I: Insurance Marketing 4.5 CP
Subject 3: Stochastic modeling and optimization: Simulation I 4,5 CP + Simulation II 4,5 CP = 9 CP
Required field: Computer science: Smart Energy Distribution 4 CP

Semester 3: 29 CP, 6 examinations, 1 non exam assessment

Subject 2: Decision-making and game theory: auction theory 4.5 CP + experimental economic research 4,5 CP = 9 CP
Subject 3: Operations Research in Supply Chain Management: Graph Theory and Advanced Location Models 4.5 CP, Site Planning and Strategic Supply Chain Management 4.5 CP = 9 CP
Subject 5: Seminar Math 3 CP
Required field: Informatics: Knowledge Discovery 5 CP + Seminar Informatik B (Master) 3 CP = 8 CP

Semester 4: 30 CP

Master Thesis

2 Study plan according to SPO 2009

Preface

This study plan is intended to supplement and explain the study and examination regulations of the Master's degree program in Economathematics, and to provide students with concrete examples of the organization of their studies.

1. Qualification objectives and profile of the degree program

The interdisciplinary Master's degree program in Economathematics provides the qualification for a professional activity in the fields of industry, banking, insurance, logistics, software development and research. Through the research-oriented training, the graduates are prepared especially for lifelong learning.

Professional key qualifications

Graduates have a broad knowledge of mathematical and economic sciences, including specific methods and techniques in the fields of analysis / numerics / optimization, stochastics, finance / risk management / managerial economics and operations management / data analysis / Informatics. They are able to analyze and explain current, complex questions in these fields. They can use methods from economics and mathematics, combine them and work interdisciplinarily. Based on these methods, they are able to handle practical and research-relevant questions. Graduates have trained analytical thinking and can work independently and reflectively. They are also able to acquire additional knowledge for further questions themselves.

Interdisciplinary qualifications

Graduates can analyze, evaluate and solve problems in new and unfamiliar situations in a multidisciplinary context. They are able to integrate their knowledge independently, deal with high complexity, and they have endurance in solving difficult problems. Graduates are capable of documenting, illustrating and interpreting results which have been obtained. They always take into account social, scientific and ethical conditions. They can argue and defend a position with experts as well as with laymen, on problems and solutions at a scientific level. In addition, they have the ability to work in a team and are able to use their knowledge effectively.

Learning outcomes

The graduates can name, explain and apply deepening mathematical methods in economics. They are also able to identify the application of these methods. The graduates have an understanding of economic processes and can comment on economic topics. They will gain an in-depth understanding of mathematical methods in the fields of analysis / numerics / optimization and stochastics.
In the profile *Financial Engineering*, graduates have a broad knowledge of financial mathematical models and methods as well as financial concepts and concepts. This enables them to analyze complex and innovative tasks in this field and to assess the results.
In the Profile *Operations Research*, graduates acquire a broad knowledge of mathematical and economic models and methods of corporate management. This enables them to analyze complex and innovative tasks in this field and to assess the results.

2. Structure of the degree program

The courses are held in the form of modules, with most modules consisting of at least one course (with or without an exercise) or a seminar. Each module closes with a learning control. The average workload is measured in credit points (CP). In general, modules are graded. The grade is included in the final score. The master thesis consists of a separate module with 30 CP. In total, 120 credits must be gained in the Master's degree, approximately evenly distributed over four semesters.
The Master's degree in Economathematics is based on the two disciplines mathematics and economics, which are offered by the department of Mathematics and the department of Economics and Management. Modules from both disciplines must be selected as follows. Modules from both disciplines must be selected as follows.

Subject Mathematics

There are the following four mathematical fields:

1. Stochastics
2. Applied and Numerical Mathematics / Optimization
3. Analysis
4. Algebra and Geometry

A minimum of 36 credits must be gained, with 8 credits from the field of Stochastics and 8 credits from one of the fields of Analysis or Applied and Numerical Mathematics / Optimization. In the Financial Engineering study profile, there must be a minimum of 8 additional points in the field of Stochastics. The remaining 20 credits (or 12 credits in the study profile of Financial Engineering) must be obtained by any examination from the four mathematical fields.

Subject Business economics

18 CP from each of the two fields must be aquired:

1. Finance - Risk Management - Managerial Economics
2. Operations Management - Data Analysis - Informatics

Seminars

Furthermore, two seminar modules with 3 CP have to be taken. Precisely each one has to be chosen from the two disciplines mathematics and economics.

Elective subject and key qualifications

A further 12 CP are flexible. In particular, this gives the possibility of professional deepening in preparation for the master thesis. At least 8 of the 12 credits have to come from the above-mentioned mathematical or economics modules or from a vocational internship. At least 3 credits must be provided by key qualifications.

Master Thesis

The master's thesis is usually written in the fourth semester and has 30 credits. It can be supervised in both participating departments and should, as far as possible, deal with a topic relevant to content and methodology for economathematics. A prerequisite is an appropriate deepening in the subject field of the work.

3. Definition of the study profile

One of the three possible study profiles *Financial Engineering* or *Operations Research* or *Classical Economic Mathematics* is chosen in the Master's degree in Economathematics. While the last profile offers maximum flexibility in assembling the modules, the two other study profiles are focused on the choice of modules from specific fields. The scope and content for the individual study profiles are specified below. In the field of Mathematics, the module names correspond to the course names, while in Economics and Management usually different courses can be combined into one module. The combinations are described in the module handbook.

Study Profile Financial Engineering

In the study profile *Financial Engineering*, courses from modern Stochastics and Analysis of the Department of Mathematics are combined with method-oriented courses from the financial services offered by the Department of Economics and Management. The special role of stochastics in this course is emphasized by the binding choice of 16 credits from this field from the list below. The compulsory 8 credits in Applied and Numerical Mathematics / Optimization or Analysis should also be taken from the list below. The following lists are also available for the 18 credits from the fields of Finance-Risk Management-Managerial Economics and Operations Management-Data Analysis-Informatics.
Additional modules may be approved upon request to the "Prüfungsausschuss". For the remaining 12 credits from Mathematics, modules can be selected from the entire mathematical offer of the module handbook.

Stochastics (16 CP)

Applied and Numerical Mathematics / Optimization or Analysis (8 CP)

Finance - Risk Management - Managerial Economics (18 CP)

Operations Management - Data Analysis - Informatics (18 CP)

Study Profile Operations Research

In the profile *Operations Research*, courses of modern optimization and high-performance calculations from the Department of Mathematics are combined with method-oriented courses in Operations Research and Data Analysis from the Department of Economics and Management.
The following modules are intended for compulsory 8 credits in Stochastics and / or Applied and Numerical Mathematics / Optimization or Analysis. The following lists are also available for the 18 credits from the fields of Finance-Risk Management-Managerial Economics and Operations Management-Data Analysis-Informatics.

Financial Mathematics in Discrete Time	8 CP
Financial Mathematics in Continuous Time (Stochastics)	8 CP
Statistics	8 CP
Mathematical Statistics	4 CP
Asymptotic Stochastic	8 CP
Nonparametric Statistics	8 CP
Brownian Movement	4 CP
Generalized Regression Models	4 CP
Control of stochastic processes	4 CP
Time series analysis	4 CP
Financial Statistics	4 CP
Lévy Processes	4 CP

Optimization and optimal control for differential equations	4 CP
Numerical Methods for Differential Equations	8 CP
Control of stochastic processes	4 CP
Numerical Methods in Financial Mathematics	8 CP
Numerical Methods in Financial Mathematics II	8 CP
Functional analysis	8 CP
Stochastic differential equations	8 CP
Classical Methods for Partial Differential Equations	8 CP
Control theory	4 CP

Finance 1	9 CP
Finance 2	9 CP
Finance 3	9 CP
Insurance Management I	9 CP
Mathematical and Empirical Finance	9 CP
Economic theory and its application in Finance	9 CP

Informatics	9 CP
Methodical foundations of the OR	9 CP
Mathematical Optimization	9 CP
Stochastic Methods and Simulation	9 CP
Stochastic modeling and optimization	9 CP
Energy industry and technology	9 CP

Additional modules may be approved upon request to the "Prüfungsausschuss". For the remaining 20 credits from Mathematics, modules can be chosen from the entire mathematical offer of the module handbook.

Stochastics (8 CP)

Applied and Numerical Mathematics / Optimization or Analysis (8 CP)

Finance - Risk Management - Managerial Economics (18 CP)

Operations Management - Data Analysis - Informatics (18 CP)

Study profile Classical Economathematics

In the study profile *Classical Economathematics*, the greatest flexibility exists in the choice of modules. Details of the offer can be found in the module handbook.

4. Module Overlaps and Duties

For certain modules, the content overlap is very large. Therefore, the following exclusion rules apply:

- If the module *Markov-Chains* is integrated from the bachelor's mathematics, none of the courses *Stochastic decision models I and II* in the modules *Stochastic Methods and Simulation* and *Stochastic Modeling and Optimization* can be selected.
- If the module *Numerical Optimization Methods* is integrated, none of the courses *Nonlinear Optimization I* and *II* can be selected in the modules *Methodical Principles of OR* and *Mathematical Optimization*.
- If the module *Game Theory* is integrated into the subject Mathematics, the course *Introduction to the game theory* within the modules *Decision and Game Theory*, *Mathematical Optimization*, *OR in Supply Chain Management and Health Care Management* and *Stochastic Modeling and Optimization* may not be selected.

For the module *Energy Economy and Technology*, the assignment of the course *Energy System Analysis* is mandatory for the study program of Economathematics. For the module *Marketing Management*, the assignment of the courses *Product and Innovation Management* and *Market Research* is obligatory for the degree program in Economathematics.

5. Key qualifications

Part of the degree program is also the acquisition of key and interdisciplinary qualifications. This field includes over-arching events on social topics, complementary scientific programs, the application of specialist knowledge in the field of work, competence training for the targeted training of soft skills as well as foreign language training in the scientific context.
The master's degree program in Economathematics at the Departments for Mathematics and Economics and Management is characterized by an exceptionally high degree of interdisciplinarity. With the combination of mathematical and economics subjects, the acquisition of knowledge from different disciplines is an integral part of the course. Interdisciplinary thinking in connections is thereby naturally promoted. In addition, the seminars of the Master's degree program contribute significantly to the promotion of the soft skills by the training of scientifically highly qualified editing and presentation of special topics.
The key competences integrally shared within the degree program can be assigned to the following fields:

Basic skills (soft skills)

1. Teamwork, social communication and creativity techniques (for example, working in small groups, working together on the homework and reworking the course material)
2. Presentation creation and techniques
3. Logical and systematic argumentation and writing (for example, in exercises, seminars, courses and writing homework)
4. Structured problem solving and communication

Statistics	8 CP
Mathematical Statistics	4 CP
Asymptotic Stochastic	8 CP
Nonparametric Statistics	8 CP
Brownian Movement	4 CP
Generalized Regression Models	4 CP
Percolation	4 CP
Control of stochastic processes	4 CP
Time series analysis	4 CP

Optimization and optimal control for differential equations	4 CP
Parallel Calculation	5 CP
Numerical optimization methods	8 CP
Control of stochastic processes	4 CP
Functional analysis	8 CP
Variations calculation	8 CP
Classical Methods for Partial Differential Equations	8 CP
Control theory	4 CP
Optimization in Banach spaces	8 CP
Game Theory	4 CP
Graph theory	8 CP
Modeling and numerical simulation in practice	4 CP

Finance 1	9 CP
Finance 2	9 CP
Finance 3	9 CP
Insurance Management I	9 CP
Mathematical and Empirical Finance	9 CP
Decision-making and game theory	9 CP
Innovation and Growth	9 CP
Growth and agglomeration	9 CP
Strategic Management and Organization	9 CP
Microeconomic Theory	9 CP

Informatics	9 CP
Methodical foundations of the OR	9 CP
Mathematical Optimization	9 CP
Applications of the OR	9 CP
OR in Supply Chain Management and Health Care Management	9 CP
Stochastic Methods	Simulation
9 CP	
Stochastic modeling and optimization	9 CP
Energy industry and technology	9 CP
Marketing Management	9 CP

Practice orientation (enabling skills)

1. Empowerment in a professional context
2. Competences in project management
3. Business basic knowledge
4. English as a technical language

Orientation knowledge

1. Mediation of interdisciplinary knowledge
2. Institutional knowledge about economic and legal systems
3. Knowledge about international organizations
4. Media, technology and innovation

In addition to the integrative placement of key qualifications, the additional acquisition of key qualifications with a minimum of 3 credit points is envisaged. Courses that provide the necessary competencies are summarized in the module for key qualifications and are regularly updated in the relevant module description of the module handbook. This list is coordinated with the House of Competence.

Part III
Field structure

1 Master Thesis

Identifier	Module	ECTS	Responsibility
M-MATH-102917	Master Thesis (S. 103)	30	Sebastian Grensing

2 Mathematical Methods

2.1 Stochastics

Identifier	Module	ECTS	Responsibility
M-MATH-102902	Asymptotic Stochastics (S. 50)	8	Norbert Henze
M-MATH-102904	Brownian Motion (S. 54)	4	Nicole Bäuerle
M-MATH-102860	Continuous Time Finance (S. 64)	8	Nicole Bäuerle
M-MATH-102919	Discrete Time Finance (S. 68)	8	Nicole Bäuerle
M-MATH-102939	Extreme Value Theory (S. 74)	4	Vicky Fasen-Hartmann
M-MATH-102956	Forecasting: Theory and Practice (S. 77)	8	Tilmann Gneiting
M-MATH-102906	Generalized Regression Models (S. 83)	4	Bernhard Klar
M-MATH-102907	Markov Decision Processes (S. 102)	5	Nicole Bäuerle
M-MATH-102909	Mathematical Statistics (S. 107)	4	Bernhard Klar
M-MATH-102910	Nonparametric Statistics (S. 113)	4	Norbert Henze
M-MATH-102905	Percolation (S. 130)	6	Günter Last
M-MATH-102922	Poisson Processes (S. 131)	5	Günter Last
M-MATH-102947	Probability Theory and Combinatorial Optimization (S. 133)	8	Daniel Hug
M-MATH-102951	Random Graphs (S. 135)	6	Matthias Schulte
M-MATH-104055	Ruin theory (S. 137)	4	Vicky Fasen-Hartmann
M-MATH-102903	Spatial Stochastics (S. 141)	8	Günter Last
M-MATH-102946	Stein's Method (S. 147)	5	Matthias Schulte
M-MATH-102908	Stochastic Control (S. 148)	4	Nicole Bäuerle
M-MATH-102942	Stochastic Evolution Equations (S. 150)	8	Lutz Weis
M-MATH-102865	Stochastic Geometry (S. 151)	8	Daniel Hug
M-MATH-102911	Time Series Analysis (S. 152)	4	Bernhard Klar

2.2 Analysis or Applied and Numerical Mathematics, Optimization

2.2.1 Analysis

Identifier	Module	ECTS	Responsibility
M-MATH-103259	Bifurcation Theory (S. 51)	5	Rainer Mandel
M-MATH-102871	Boundary and Eigenvalue Problems (S. 53)	8	Wolfgang Reichel
M-MATH-102882	Calculus of Variations (S. 55)	8	Wolfgang Reichel
M-MATH-102870	Classical Methods for Partial Differential Equations (S. 56)	8	Michael Plum
M-MATH-102878	Complex Analysis (S. 61)	8	Christoph Schmoeger

M-MATH-102883	Computer-Assisted Analytical Methods for Boundary and Eigenvalue Problems (S. 63)	8	Michael Plum
M-MATH-102941	Control Theory (S. 65)	6	Roland Schnaubelt
M-MATH-104425	Dispersive equations (S. 69)	6	Wolfgang Reichel
M-MATH-103080	Dynamical Systems (S. 70)	8	Jens Rottmann-Matthes
M-MATH-102872	Evolution Equations (S. 71)	8	Roland Schnaubelt
M-MATH-102873	Fourier Analysis (S. 79)	8	Lutz Weis
M-MATH-101320	Functional Analysis (S. 80)	8	Roland Schnaubelt
M-MATH-103545	Harmonic Analysis for Dispersive Equations (S. 90)	8	Peer Kunstmann
M-MATH-102874	Integral Equations (S. 92)	8	Frank Hettlich
M-MATH-102890	Inverse Problems (S. 98)	8	Andreas Kirsch
M-MATH-102952	L2-Invariants (S. 100)	5	Holger Kammeyer
M-MATH-104059	Mathematical Topics in Kinetic Theory (S. 108)	4	Dirk Hundertmark
M-MATH-102885	Maxwell's Equations (S. 109)	8	Andreas Kirsch
M-MATH-103539	Nonlinear Analysis (S. 111)	8	Tobias Lamm
M-MATH-103257	Nonlinear Maxwell Equations (S. 112)	3	Roland Schnaubelt
M-MATH-102924	Optimization in Banach Spaces (S. 128)	8	Andreas Kirsch
M-MATH-102879	Potential Theory (S. 132)	8	Andreas Kirsch
M-MATH-102884	Scattering Theory (S. 138)	8	Frank Hettlich
M-MATH-102926	Sobolev Spaces (S. 140)	5	Andreas Kirsch
M-MATH-101335	Special Functions and Applications in Potential Theory (S. 142)	5	Andreas Kirsch
M-MATH-104435	Special Topics in Harmonic Analysis (S. 143)	3	Dirk Hundertmark
M-MATH-101768	Spectral Theory (S. 145)	8	Lutz Weis
M-MATH-102881	Stochastic Differential Equations (S. 149)	8	Lutz Weis
M-MATH-102942	Stochastic Evolution Equations (S. 150)	8	Lutz Weis
M-MATH-102927	Traveling Waves (S. 154)	6	Jens Rottmann-Matthes

2.2.2 Applied and Numerical Mathematics, Optimization

Identifier	Module	ECTS	Responsibility
M-MATH-104060	Adaptive finite element methods (S. 42)	8	Tobias Jahnke
M-MATH-102900	Adaptive Finite Elemente Methods (S. 43)	6	Willy Dörfler
M-MATH-102955	Advanced Inverse Problems: Nonlinearity and Banach Spaces (S. 44)	5	Andreas Rieder
M-MATH-104426	Comparison of numerical integrators for nonlinear dispersive equations (S. 60)	4	Katharina Schratz
M-MATH-102935	Compressive Sensing (S. 62)	5	Andreas Rieder
M-MATH-103700	Exponential Integrators (S. 72)	6	Marlis Hochbruck
M-MATH-102891	Finite Element Methods (S. 75)	8	Willy Dörfler,Christian Wieners
M-MATH-103527	Foundations of continuum mechanics (S. 78)	3	Christian Wieners
M-MATH-102937	Functions of Matrices (S. 81)	8	Volker Grimm
M-MATH-102936	Functions of Operators (S. 82)	6	Volker Grimm
M-MATH-102921	Geometric Numerical Integration (S. 85)	6	Tobias Jahnke
M-MATH-102874	Integral Equations (S. 92)	8	Frank Hettlich
M-MATH-102943	Introduction into Particulate Flows (S. 93)	3	Willy Dörfler
M-MATH-103919	Introduction to Kinetic Theory (S. 95)	4	Martin Frank
M-MATH-102945	Introduction to Matlab and Numerical Algorithms (S. 96)	5	Daniel Weiß
M-MATH-102889	Introduction to Scientific Computing (S. 97)	8	Willy Dörfler,Tobias Jahnke
M-MATH-102890	Inverse Problems (S. 98)	8	Andreas Kirsch
M-MATH-102897	Mathematical Methods in Signal and Image Processing (S. 104)	8	Andreas Rieder
M-MATH-103260	Mathematical Methods of Imaging (S. 105)	5	Andreas Rieder

M-MATH-102929	Mathematical Modelling and Simulation in Practise (S. 106)	4	Gudrun Thäter
M-MATH-102885	Maxwell's Equations (S. 109)	8	Andreas Kirsch
M-MATH-102896	Medical Imaging (S. 110)	8	Andreas Rieder
M-MATH-102944	Numerical Continuation Methods (S. 114)	5	Jens Rottmann-Matthes
M-MATH-103709	Numerical Linear Algebra for Scientific High Performance Computing (S. 115)	3	Hartwig Anzt
M-MATH-104058	Numerical Linear Algebra in Image Processing (S. 116)	6	Volker Grimm
M-MATH-102888	Numerical Methods for Differential Equations (S. 117)	8	Willy Dörfler,Tobias Jahnke
M-MATH-102915	Numerical Methods for Hyperbolic Equations (S. 118)	6	Willy Dörfler
M-MATH-102930	Numerical Methods for Integral Equations (S. 119)	8	Tilo Arens
M-MATH-102931	Numerical Methods for Maxwell's Equations (S. 120)	6	Marlis Hochbruck,Tobias Jahnke
M-MATH-102928	Numerical Methods for Time-Dependent Partial Differential Equations (S. 121)	8	Marlis Hochbruck
M-MATH-102894	Numerical Methods in Computational Electrodynamics (S. 122)	6	Willy Dörfler
M-MATH-102932	Numerical Methods in Fluid Mechanics (S. 123)	4	Willy Dörfler,Gudrun Thäter
M-MATH-102901	Numerical Methods in Mathematical Finance (S. 124)	8	Tobias Jahnke
M-MATH-102914	Numerical Methods in Mathematical Finance II (S. 125)	8	Tobias Jahnke
M-MATH-102892	Numerical Optimisation Methods (S. 126)	8	Christian Wieners
M-MATH-102899	Optimisation and Optimal Control for Differential Equations (S. 127)	4	Christian Wieners
M-MATH-102924	Optimization in Banach Spaces (S. 128)	8	Andreas Kirsch
M-MATH-101338	Parallel Computing (S. 129)	5	Mathias Krause,Christian Wieners
M-MATH-102879	Potential Theory (S. 132)	8	Andreas Kirsch
M-MATH-102938	Project Centered Software-Lab (S. 134)	4	Gudrun Thäter
M-MATH-102884	Scattering Theory (S. 138)	8	Frank Hettlich
M-MATH-102926	Sobolev Spaces (S. 140)	5	Andreas Kirsch
M-MATH-101335	Special Functions and Applications in Potential Theory (S. 142)	5	Andreas Kirsch
M-MATH-102920	Special Topics of Numerical Linear Algebra (S. 144)	8	Marlis Hochbruck
M-MATH-104054	Uncertainty Quantification (S. 155)	4	Martin Frank
M-MATH-102895	Wavelets (S. 156)	8	Andreas Rieder

2.3 Elective Field Mathematical Methods

2.3.1 Algebra and Geometry

Identifier	Module	ECTS	Responsibility
M-MATH-102960	The Riemann Zeta Function (S. 41)	4	Fabian Januszewski
M-MATH-101315	Algebra (S. 45)	8	Frank Herrlich
M-MATH-101724	Algebraic Geometry (S. 46)	8	Frank Herrlich
M-MATH-101725	Algebraic Number Theory (S. 47)	8	Stefan Kühnlein
M-MATH-102948	Algebraic Topology (S. 48)	8	Roman Sauer
M-MATH-102953	Algebraic Topology II (S. 49)	8	Roman Sauer
M-MATH-104349	Bott Periodicity (S. 52)	5	
M-MATH-102950	Combinatorics (S. 57)	8	Maria Aksenovich
M-MATH-104053	Commutative Algebra (S. 58)	8	Frank Herrlich
M-MATH-102940	Comparison Geometry (S. 59)	5	Wilderich Tuschmann
M-MATH-102864	Convex Geometry (S. 66)	8	Daniel Hug
M-MATH-101317	Differential Geometry (S. 67)	8	Wilderich Tuschmann

M-MATH-102957	Extremal Graph Theory (S. 73)	8	Maria Aksenovich
M-MATH-103258	Finite group schemes (S. 76)	4	Frank Herrlich,Fabian Januszewski
M-MATH-102867	Geometric Group Theory (S. 84)	8	Roman Sauer
M-MATH-102866	Geometry of Schemes (S. 86)	8	Frank Herrlich
M-MATH-102912	Global Differential Geometry (S. 87)	8	Wilderich Tuschmann
M-MATH-101336	Graph Theory (S. 88)	8	Maria Aksenovich
M-MATH-102954	Group Actions in Riemannian Geometry (S. 89)	5	Wilderich Tuschmann
M-MATH-102959	Homotopy Theory (S. 91)	8	Roman Sauer
M-MATH-102949	Introduction to Geometric Measure Theory (S. 94)	6	Steffen Winter
M-MATH-104057	Key Moments in Geometry (S. 99)	5	Wilderich Tuschmann
M-MATH-102952	L2-Invariants (S. 100)	5	Holger Kammeyer
M-MATH-104261	Lie groups and Lie algebras (S. 101)	8	Enrico Leuzinger
M-MATH-103256	Rational Homotopy Theory (S. 136)	4	Manuel Amann,Roman Sauer
M-MATH-102958	Spin Manifolds, Alpha Invariant and Positive Scalar Curvature (S. 146)	5	Wilderich Tuschmann
M-MATH-102865	Stochastic Geometry (S. 151)	8	Daniel Hug
M-MATH-103543	Topics in number theory: class field theory and zeta-functions (S. 153)	8	Claus-Günther Schmidt

2.3.2 Analysis

Identifier	Module	ECTS	Responsibility
M-MATH-103259	Bifurcation Theory (S. 51)	5	Rainer Mandel
M-MATH-102871	Boundary and Eigenvalue Problems (S. 53)	8	Wolfgang Reichel
M-MATH-102882	Calculus of Variations (S. 55)	8	Wolfgang Reichel
M-MATH-102870	Classical Methods for Partial Differential Equations (S. 56)	8	Michael Plum
M-MATH-102878	Complex Analysis (S. 61)	8	Christoph Schmoeger
M-MATH-102883	Computer-Assisted Analytical Methods for Boundary and Eigenvalue Problems (S. 63)	8	Michael Plum
M-MATH-102941	Control Theory (S. 65)	6	Roland Schnaubelt
M-MATH-104425	Dispersive equations (S. 69)	6	Wolfgang Reichel
M-MATH-103080	Dynamical Systems (S. 70)	8	Jens Rottmann-Matthes
M-MATH-102872	Evolution Equations (S. 71)	8	Roland Schnaubelt
M-MATH-102873	Fourier Analysis (S. 79)	8	Lutz Weis
M-MATH-101320	Functional Analysis (S. 80)	8	Roland Schnaubelt
M-MATH-103545	Harmonic Analysis for Dispersive Equations (S. 90)	8	Peer Kunstmann
M-MATH-102874	Integral Equations (S. 92)	8	Frank Hettlich
M-MATH-102890	Inverse Problems (S. 98)	8	Andreas Kirsch
M-MATH-102952	L2-Invariants (S. 100)	5	Holger Kammeyer
M-MATH-104059	Mathematical Topics in Kinetic Theory (S. 108)	4	Dirk Hundertmark
M-MATH-102885	Maxwell's Equations (S. 109)	8	Andreas Kirsch
M-MATH-103539	Nonlinear Analysis (S. 111)	8	Tobias Lamm
M-MATH-103257	Nonlinear Maxwell Equations (S. 112)	3	Roland Schnaubelt
M-MATH-102924	Optimization in Banach Spaces (S. 128)	8	Andreas Kirsch
M-MATH-102879	Potential Theory (S. 132)	8	Andreas Kirsch
M-MATH-102926	Sobolev Spaces (S. 140)	5	Andreas Kirsch
M-MATH-101335	Special Functions and Applications in Potential Theory (S. 142)	5	Andreas Kirsch
M-MATH-104435	Special Topics in Harmonic Analysis (S. 143)	3	Dirk Hundertmark
M-MATH-101768	Spectral Theory (S. 145)	8	Lutz Weis
M-MATH-102881	Stochastic Differential Equations (S. 149)	8	Lutz Weis
M-MATH-102942	Stochastic Evolution Equations (S. 150)	8	Lutz Weis
M-MATH-102927	Traveling Waves (S. 154)	6	Jens Rottmann-Matthes

2.3.3 Applied and Numerical Mathematics, Optimization

Identifier	Module	ECTS	Responsibility
M-MATH-104060	Adaptive finite element methods (S. 42)	8	Tobias Jahnke
M-MATH-102900	Adaptive Finite Elemente Methods (S. 43)	6	Willy Dörfler
M-MATH-102955	Advanced Inverse Problems: Nonlinearity and Banach Spaces (S. 44)	5	Andreas Rieder
M-MATH-104426	Comparison of numerical integrators for nonlinear dispersive equations (S. 60)	4	Katharina Schratz
M-MATH-102935	Compressive Sensing (S. 62)	5	Andreas Rieder
M-MATH-103700	Exponential Integrators (S. 72)	6	Marlis Hochbruck
M-MATH-102891	Finite Element Methods (S. 75)	8	Willy Dörfler,Christian Wieners
M-MATH-103527	Foundations of continuum mechanics (S. 78)	3	Christian Wieners
M-MATH-102937	Functions of Matrices (S. 81)	8	Volker Grimm
M-MATH-102936	Functions of Operators (S. 82)	6	Volker Grimm
M-MATH-102921	Geometric Numerical Integration (S. 85)	6	Tobias Jahnke
M-MATH-102874	Integral Equations (S. 92)	8	Frank Hettlich
M-MATH-102943	Introduction into Particulate Flows (S. 93)	3	Willy Dörfler
M-MATH-103919	Introduction to Kinetic Theory (S. 95)	4	Martin Frank
M-MATH-102945	Introduction to Matlab and Numerical Algorithms (S. 96)	5	Daniel Weiß
M-MATH-102889	Introduction to Scientific Computing (S. 97)	8	Willy Dörfler,Tobias Jahnke
M-MATH-102890	Inverse Problems (S. 98)	8	Andreas Kirsch
M-MATH-102897	Mathematical Methods in Signal and Image Processing (S. 104)	8	Andreas Rieder
M-MATH-103260	Mathematical Methods of Imaging (S. 105)	5	Andreas Rieder
M-MATH-102929	Mathematical Modelling and Simulation in Practise (S. 106)	4	Gudrun Thäter
M-MATH-102885	Maxwell's Equations (S. 109)	8	Andreas Kirsch
M-MATH-102896	Medical Imaging (S. 110)	8	Andreas Rieder
M-MATH-102944	Numerical Continuation Methods (S. 114)	5	Jens Rottmann-Matthes
M-MATH-103709	Numerical Linear Algebra for Scientific High Performance Computing (S. 115)	3	Hartwig Anzt
M-MATH-104058	Numerical Linear Algebra in Image Processing (S. 116)	6	Volker Grimm
M-MATH-102888	Numerical Methods for Differential Equations (S. 117)	8	Willy Dörfler,Tobias Jahnke
M-MATH-102915	Numerical Methods for Hyperbolic Equations (S. 118)	6	Willy Dörfler
M-MATH-102930	Numerical Methods for Integral Equations (S. 119)	8	Tilo Arens
M-MATH-102931	Numerical Methods for Maxwell's Equations (S. 120)	6	Marlis Hochbruck,Tobias Jahnke
M-MATH-102928	Numerical Methods for Time-Dependent Partial Differential Equations (S. 121)	8	Marlis Hochbruck
M-MATH-102894	Numerical Methods in Computational Electrodynamics (S. 122)	6	Willy Dörfler
M-MATH-102932	Numerical Methods in Fluid Mechanics (S. 123)	4	Willy Dörfler,Gudrun Thäter
M-MATH-102901	Numerical Methods in Mathematical Finance (S. 124)	8	Tobias Jahnke
M-MATH-102914	Numerical Methods in Mathematical Finance II (S. 125)	8	Tobias Jahnke
M-MATH-102892	Numerical Optimisation Methods (S. 126)	8	Christian Wieners
M-MATH-102899	Optimisation and Optimal Control for Differential Equations (S. 127)	4	Christian Wieners
M-MATH-102924	Optimization in Banach Spaces (S. 128)	8	Andreas Kirsch
M-MATH-101338	Parallel Computing (S. 129)	5	Mathias Krause,Christian Wieners
M-MATH-102879	Potential Theory (S. 132)	8	Andreas Kirsch

M-MATH-102938	Project Centered Software-Lab (S. 134)	4	Gudrun Thäter
M-MATH-102926	Sobolev Spaces (S. 140)	5	Andreas Kirsch
M-MATH-101335	Special Functions and Applications in Potential Theory (S. 142)	5	Andreas Kirsch
M-MATH-102920	Special Topics of Numerical Linear Algebra (S. 144)	8	Marlis Hochbruck
M-MATH-104054	Uncertainty Quantification (S. 155)	4	Martin Frank
M-MATH-102895	Wavelets (S. 156)	8	Andreas Rieder

2.3.4 Stochastics

Identifier	Module	ECTS	Responsibility
M-MATH-102902	Asymptotic Stochastics (S. 50)	8	Norbert Henze
M-MATH-102904	Brownian Motion (S. 54)	4	Nicole Bäuerle
M-MATH-102860	Continuous Time Finance (S. 64)	8	Nicole Bäuerle
M-MATH-102919	Discrete Time Finance (S. 68)	8	Nicole Bäuerle
M-MATH-102939	Extreme Value Theory (S. 74)	4	Vicky Fasen-Hartmann
M-MATH-102956	Forecasting: Theory and Practice (S. 77)	8	Tilmann Gneiting
M-MATH-102906	Generalized Regression Models (S. 83)	4	Bernhard Klar
M-MATH-102907	Markov Decision Processes (S. 102)	5	Nicole Bäuerle
M-MATH-102909	Mathematical Statistics (S. 107)	4	Bernhard Klar
M-MATH-102910	Nonparametric Statistics (S. 113)	4	Norbert Henze
M-MATH-102905	Percolation (S. 130)	6	Günter Last
M-MATH-102922	Poisson Processes (S. 131)	5	Günter Last
M-MATH-102947	Probability Theory and Combinatorial Optimization (S. 133)	8	Daniel Hug
M-MATH-102951	Random Graphs (S. 135)	6	Matthias Schulte
M-MATH-104055	Ruin theory (S. 137)	4	Vicky Fasen-Hartmann
M-MATH-102903	Spatial Stochastics (S. 141)	8	Günter Last
M-MATH-102946	Stein's Method (S. 147)	5	Matthias Schulte
M-MATH-102908	Stochastic Control (S. 148)	4	Nicole Bäuerle
M-MATH-102942	Stochastic Evolution Equations (S. 150)	8	Lutz Weis
M-MATH-102865	Stochastic Geometry (S. 151)	8	Daniel Hug
M-MATH-102911	Time Series Analysis (S. 152)	4	Bernhard Klar

3 Finance - Risk Management - Managerial Economics

Identifier	Module	ECTS	Responsibility
M-WIWI-103119	Advanced Topics in Strategy and Management (S. 157)	9	Hagen Lindstädt
M-WIWI-101637	Analytics and Statistics (S. 159)	9	Oliver Grothe
M-WIWI-101504	Collective Decision Making (S. 163)	9	Clemens Puppe
M-WIWI-102970	Decision and Game Theory (S. 164)	9	Clemens Puppe
M-WIWI-103261	Disruptive FinTech Innovations (S. 165)	9	Maxim Ulrich
M-WIWI-101638	Econometrics and Statistics I (S. 166)	9	Melanie Schienle
M-WIWI-101639	Econometrics and Statistics II (S. 167)	9	Melanie Schienle
M-WIWI-101502	Economic Theory and its Application in Finance (S. 169)	9	Kay Mitusch
M-WIWI-103720	eEnergy: Markets, Services and Systems (S. 171)	9	Christof Weinhardt
M-WIWI-101505	Experimental Economics (S. 174)	9	Johannes Philipp Reiß
M-WIWI-101482	Finance 1 (S. 175)	9	Martin Ruckes,Marliese Uhrig-Homburg

M-WIWI-101483	Finance 2 (S. 176)	9	Martin Ruckes,Marliese Uhrig-Homburg
M-WIWI-101480	Finance 3 (S. 178)	9	Martin Ruckes,Marliese Uhrig-Homburg
M-WIWI-101496	Growth and Agglomeration (S. 180)	9	Ingrid Ott
M-WIWI-104068	Information Systems in Organizations (S. 183)	9	Alexander Mädche
M-WIWI-101478	Innovation and Growth (S. 185)	9	Ingrid Ott
M-WIWI-101469	Insurance Management I (S. 187)	9	Ute Werner
M-WIWI-103247	Intelligent Risk and Investment Advisory (S. 189)	9	Maxim Ulrich
M-WIWI-101500	Microeconomic Theory (S. 196)	9	Clemens Puppe

4 Operations Management - Data Analysis - Informatics

Identifier	Module	ECTS	Responsibility
M-WIWI-101413	Applications of Operations Research (S. 161)	9	Stefan Nickel
M-WIWI-101452	Energy Economics and Technology (S. 172)	9	Wolf Fichtner
M-WIWI-101472	Informatics (S. 181)	9	Andreas Oberweis,Harald Sack,York Sure-Vetter,Johann Marius Zöllner
M-WIWI-101490	Marketing Management (S. 190)	9	Martin Klarmann
M-WIWI-101473	Mathematical Programming (S. 192)	9	Oliver Stein
M-WIWI-101414	Methodical Foundations of OR (S. 194)	9	Oliver Stein
M-WIWI-102832	Operations Research in Supply Chain Management (S. 197)	9	Stefan Nickel
M-WIWI-102805	Service Operations (S. 205)	9	Stefan Nickel
M-WIWI-103289	Stochastic Optimization (S. 207)	9	Steffen Rebennack

5 Seminar in Economics and Management

Identifier	Module	ECTS	Responsibility
M-WIWI-102971	Seminar (S. 199)	3	Hagen Lindstädt,Oliver Stein
M-WIWI-102973	Seminar (S. 201)	3	Hagen Lindstädt,Oliver Stein

6 Mathematical Seminar

Identifier	Module	ECTS	Responsibility
M-MATH-102730	Seminar (S. 139)	3	Stefan Kühnlein

7 Elective Field

Identifier	Module	ECTS	Responsibility

M-MATH-102960	The Riemann Zeta Function (S. 41)	4	Fabian Januszewski
M-MATH-104060	Adaptive finite element methods (S. 42)	8	Tobias Jahnke
M-MATH-102900	Adaptive Finite Elemente Methods (S. 43)	6	Willy Dörfler
M-MATH-102955	Advanced Inverse Problems: Nonlinearity and Banach Spaces (S. 44)	5	Andreas Rieder
M-MATH-101315	Algebra (S. 45)	8	Frank Herrlich
M-MATH-101724	Algebraic Geometry (S. 46)	8	Frank Herrlich
M-MATH-101725	Algebraic Number Theory (S. 47)	8	Stefan Kühnlein
M-MATH-102948	Algebraic Topology (S. 48)	8	Roman Sauer
M-MATH-102953	Algebraic Topology II (S. 49)	8	Roman Sauer
M-MATH-102902	Asymptotic Stochastics (S. 50)	8	Norbert Henze
M-MATH-103259	Bifurcation Theory (S. 51)	5	Rainer Mandel
M-MATH-104349	Bott Periodicity (S. 52)	5	
M-MATH-102871	Boundary and Eigenvalue Problems (S. 53)	8	Wolfgang Reichel
M-MATH-102904	Brownian Motion (S. 54)	4	Nicole Bäuerle
M-MATH-102882	Calculus of Variations (S. 55)	8	Wolfgang Reichel
M-MATH-102870	Classical Methods for Partial Differential Equations (S. 56)	8	Michael Plum
M-MATH-102950	Combinatorics (S. 57)	8	Maria Aksenovich
M-MATH-104053	Commutative Algebra (S. 58)	8	Frank Herrlich
M-MATH-102940	Comparison Geometry (S. 59)	5	Wilderich Tuschmann
M-MATH-104426	Comparison of numerical integrators for nonlinear dispersive equations (S. 60)	4	Katharina Schratz
M-MATH-102878	Complex Analysis (S. 61)	8	Christoph Schmoeger
M-MATH-102935	Compressive Sensing (S. 62)	5	Andreas Rieder
M-MATH-102883	Computer-Assisted Analytical Methods for Boundary and Eigenvalue Problems (S. 63)	8	Michael Plum
M-MATH-102860	Continuous Time Finance (S. 64)	8	Nicole Bäuerle
M-MATH-102941	Control Theory (S. 65)	6	Roland Schnaubelt
M-MATH-102864	Convex Geometry (S. 66)	8	Daniel Hug
M-MATH-101317	Differential Geometry (S. 67)	8	Wilderich Tuschmann
M-MATH-102919	Discrete Time Finance (S. 68)	8	Nicole Bäuerle
M-MATH-104425	Dispersive equations (S. 69)	6	Wolfgang Reichel
M-MATH-103080	Dynamical Systems (S. 70)	8	Jens Rottmann-Matthes
M-MATH-102872	Evolution Equations (S. 71)	8	Roland Schnaubelt
M-MATH-103700	Exponential Integrators (S. 72)	6	Marlis Hochbruck
M-MATH-102957	Extremal Graph Theory (S. 73)	8	Maria Aksenovich
M-MATH-102939	Extreme Value Theory (S. 74)	4	Vicky Fasen-Hartmann
M-MATH-102891	Finite Element Methods (S. 75)	8	Willy Dörfler,Christian Wieners
M-MATH-103258	Finite group schemes (S. 76)	4	Frank Herrlich,Fabian Januszewski
M-MATH-102956	Forecasting: Theory and Practice (S. 77)	8	Tilmann Gneiting
M-MATH-103527	Foundations of continuum mechanics (S. 78)	3	Christian Wieners
M-MATH-102873	Fourier Analysis (S. 79)	8	Lutz Weis
M-MATH-101320	Functional Analysis (S. 80)	8	Roland Schnaubelt
M-MATH-102937	Functions of Matrices (S. 81)	8	Volker Grimm
M-MATH-102936	Functions of Operators (S. 82)	6	Volker Grimm
M-MATH-102906	Generalized Regression Models (S. 83)	4	Bernhard Klar
M-MATH-102867	Geometric Group Theory (S. 84)	8	Roman Sauer
M-MATH-102921	Geometric Numerical Integration (S. 85)	6	Tobias Jahnke
M-MATH-102866	Geometry of Schemes (S. 86)	8	Frank Herrlich
M-MATH-102912	Global Differential Geometry (S. 87)	8	Wilderich Tuschmann
M-MATH-101336	Graph Theory (S. 88)	8	Maria Aksenovich
M-MATH-102954	Group Actions in Riemannian Geometry (S. 89)	5	Wilderich Tuschmann
M-MATH-103545	Harmonic Analysis for Dispersive Equations (S. 90)	8	Peer Kunstmann
M-MATH-102959	Homotopy Theory (S. 91)	8	Roman Sauer
M-MATH-102874	Integral Equations (S. 92)	8	Frank Hettlich

M-MATH-102943	Introduction into Particulate Flows (S. 93)	3	Willy Dörfler
M-MATH-102949	Introduction to Geometric Measure Theory (S. 94)	6	Steffen Winter
M-MATH-103919	Introduction to Kinetic Theory (S. 95)	4	Martin Frank
M-MATH-102945	Introduction to Matlab and Numerical Algorithms (S. 96)	5	Daniel Weiß
M-MATH-102889	Introduction to Scientific Computing (S. 97)	8	Willy Dörfler, Tobias Jahnke
M-MATH-102890	Inverse Problems (S. 98)	8	Andreas Kirsch
M-MATH-104057	Key Moments in Geometry (S. 99)	5	Wilderich Tuschmann
M-MATH-102952	L2-Invariants (S. 100)	5	Holger Kammeyer
M-MATH-104261	Lie groups and Lie algebras (S. 101)	8	Enrico Leuzinger
M-MATH-102907	Markov Decision Processes (S. 102)	5	Nicole Bäuerle
M-MATH-102897	Mathematical Methods in Signal and Image Processing (S. 104)	8	Andreas Rieder
M-MATH-103260	Mathematical Methods of Imaging (S. 105)	5	Andreas Rieder
M-MATH-102929	Mathematical Modelling and Simulation in Practise (S. 106)	4	Gudrun Thäter
M-MATH-102909	Mathematical Statistics (S. 107)	4	Bernhard Klar
M-MATH-104059	Mathematical Topics in Kinetic Theory (S. 108)	4	Dirk Hundertmark
M-MATH-102885	Maxwell's Equations (S. 109)	8	Andreas Kirsch
M-MATH-102896	Medical Imaging (S. 110)	8	Andreas Rieder
M-MATH-103539	Nonlinear Analysis (S. 111)	8	Tobias Lamm
M-MATH-103257	Nonlinear Maxwell Equations (S. 112)	3	Roland Schnaubelt
M-MATH-102910	Nonparametric Statistics (S. 113)	4	Norbert Henze
M-MATH-102944	Numerical Continuation Methods (S. 114)	5	Jens Rottmann-Matthes
M-MATH-103709	Numerical Linear Algebra for Scientific High Performance Computing (S. 115)	3	Hartwig Anzt
M-MATH-104058	Numerical Linear Algebra in Image Processing (S. 116)	6	Volker Grimm
M-MATH-102888	Numerical Methods for Differential Equations (S. 117)	8	Willy Dörfler, Tobias Jahnke
M-MATH-102915	Numerical Methods for Hyperbolic Equations (S. 118)	6	Willy Dörfler
M-MATH-102930	Numerical Methods for Integral Equations (S. 119)	8	Tilo Arens
M-MATH-102931	Numerical Methods for Maxwell's Equations (S. 120)	6	Marlis Hochbruck, Tobias Jahnke
M-MATH-102928	Numerical Methods for Time-Dependent Partial Differential Equations (S. 121)	8	Marlis Hochbruck
M-MATH-102894	Numerical Methods in Computational Electrodynamics (S. 122)	6	Willy Dörfler
M-MATH-102932	Numerical Methods in Fluid Mechanics (S. 123)	4	Willy Dörfler, Gudrun Thäter
M-MATH-102901	Numerical Methods in Mathematical Finance (S. 124)	8	Tobias Jahnke
M-MATH-102914	Numerical Methods in Mathematical Finance II (S. 125)	8	Tobias Jahnke
M-MATH-102892	Numerical Optimisation Methods (S. 126)	8	Christian Wieners
M-MATH-102899	Optimisation and Optimal Control for Differential Equations (S. 127)	4	Christian Wieners
M-MATH-102924	Optimization in Banach Spaces (S. 128)	8	Andreas Kirsch
M-MATH-101338	Parallel Computing (S. 129)	5	Mathias Krause, Christian Wieners
M-MATH-102905	Percolation (S. 130)	6	Günter Last
M-MATH-102922	Poisson Processes (S. 131)	5	Günter Last
M-MATH-102879	Potential Theory (S. 132)	8	Andreas Kirsch
M-MATH-102947	Probability Theory and Combinatorial Optimization (S. 133)	8	Daniel Hug
M-MATH-102938	Project Centered Software-Lab (S. 134)	4	Gudrun Thäter
M-MATH-102951	Random Graphs (S. 135)	6	Matthias Schulte
M-MATH-103256	Rational Homotopy Theory (S. 136)	4	Manuel Amann, Roman Sauer
M-MATH-104055	Ruin theory (S. 137)	4	Vicky Fasen-Hartmann
M-MATH-102884	Scattering Theory (S. 138)	8	Frank Hettlich
M-MATH-102926	Sobolev Spaces (S. 140)	5	Andreas Kirsch

M-MATH-102903	Spatial Stochastics (S. 141)	8	Günter Last
M-MATH-101335	Special Functions and Applications in Potential Theory (S. 142)	5	Andreas Kirsch
M-MATH-104435	Special Topics in Harmonic Analysis (S. 143)	3	Dirk Hundertmark
M-MATH-102920	Special Topics of Numerical Linear Algebra (S. 144)	8	Marlis Hochbruck
M-MATH-101768	Spectral Theory (S. 145)	8	Lutz Weis
M-MATH-102958	Spin Manifolds, Alpha Invariant and Positive Scalar Curvature (S. 146)	5	Wilderich Tuschmann
M-MATH-102946	Stein's Method (S. 147)	5	Matthias Schulte
M-MATH-102908	Stochastic Control (S. 148)	4	Nicole Bäuerle
M-MATH-102881	Stochastic Differential Equations (S. 149)	8	Lutz Weis
M-MATH-102942	Stochastic Evolution Equations (S. 150)	8	Lutz Weis
M-MATH-102865	Stochastic Geometry (S. 151)	8	Daniel Hug
M-MATH-102911	Time Series Analysis (S. 152)	4	Bernhard Klar
M-MATH-103543	Topics in number theory: class field theory and zeta-functions (S. 153)	8	Claus-Günther Schmidt
M-MATH-102927	Traveling Waves (S. 154)	6	Jens Rottmann-Matthes
M-MATH-104054	Uncertainty Quantification (S. 155)	4	Martin Frank
M-MATH-102895	Wavelets (S. 156)	8	Andreas Rieder
M-WIWI-103119	Advanced Topics in Strategy and Management (S. 157)	9	Hagen Lindstädt
M-WIWI-101637	Analytics and Statistics (S. 159)	9	Oliver Grothe
M-WIWI-101413	Applications of Operations Research (S. 161)	9	Stefan Nickel
M-WIWI-101504	Collective Decision Making (S. 163)	9	Clemens Puppe
M-WIWI-102970	Decision and Game Theory (S. 164)	9	Clemens Puppe
M-WIWI-103261	Disruptive FinTech Innovations (S. 165)	9	Maxim Ulrich
M-WIWI-101638	Econometrics and Statistics I (S. 166)	9	Melanie Schienle
M-WIWI-101639	Econometrics and Statistics II (S. 167)	9	Melanie Schienle
M-WIWI-101502	Economic Theory and its Application in Finance (S. 169)	9	Kay Mitusch
M-WIWI-103720	eEnergy: Markets, Services and Systems (S. 171)	9	Christof Weinhardt
M-WIWI-101452	Energy Economics and Technology (S. 172)	9	Wolf Fichtner
M-WIWI-101505	Experimental Economics (S. 174)	9	Johannes Philipp Reiß
M-WIWI-101482	Finance 1 (S. 175)	9	Martin Ruckes,Marliese Uhrig-Homburg
M-WIWI-101483	Finance 2 (S. 176)	9	Martin Ruckes,Marliese Uhrig-Homburg
M-WIWI-101480	Finance 3 (S. 178)	9	Martin Ruckes,Marliese Uhrig-Homburg
M-WIWI-101496	Growth and Agglomeration (S. 180)	9	Ingrid Ott
M-WIWI-101472	Informatics (S. 181)	9	Andreas Oberweis,Harald Sack,York Sure-Vetter,Johann Marius Zöllner
M-WIWI-104068	Information Systems in Organizations (S. 183)	9	Alexander Mädche
M-WIWI-101478	Innovation and Growth (S. 185)	9	Ingrid Ott
M-WIWI-101469	Insurance Management I (S. 187)	9	Ute Werner
M-WIWI-103247	Intelligent Risk and Investment Advisory (S. 189)	9	Maxim Ulrich
M-WIWI-101490	Marketing Management (S. 190)	9	Martin Klarmann
M-WIWI-101473	Mathematical Programming (S. 192)	9	Oliver Stein
M-WIWI-101414	Methodical Foundations of OR (S. 194)	9	Oliver Stein
M-WIWI-101500	Microeconomic Theory (S. 196)	9	Clemens Puppe
M-WIWI-102832	Operations Research in Supply Chain Management (S. 197)	9	Stefan Nickel
M-WIWI-102971	Seminar (S. 199)	3	Hagen Lindstädt,Oliver Stein
M-WIWI-102973	Seminar (S. 201)	3	Hagen Lindstädt,Oliver Stein
M-WIWI-102972	Seminar (S. 202)	3	Hagen Lindstädt,Oliver Stein
M-WIWI-102974	Seminar (S. 204)	3	Hagen Lindstädt,Oliver Stein
M-WIWI-103289	Stochastic Optimization (S. 207)	9	Steffen Rebennack

8 Additional Examinations

Identifier	Module	ECTS	Responsibility
M-MATH-102960	The Riemann Zeta Function (S. 41)	4	Fabian Januszewski
M-MATH-104060	Adaptive finite element methods (S. 42)	8	Tobias Jahnke
M-MATH-102900	Adaptive Finite Elemente Methods (S. 43)	6	Willy Dörfler
M-MATH-102955	Advanced Inverse Problems: Nonlinearity and Banach Spaces (S. 44)	5	Andreas Rieder
M-MATH-101315	Algebra (S. 45)	8	Frank Herrlich
M-MATH-101724	Algebraic Geometry (S. 46)	8	Frank Herrlich
M-MATH-101725	Algebraic Number Theory (S. 47)	8	Stefan Kühnlein
M-MATH-102948	Algebraic Topology (S. 48)	8	Roman Sauer
M-MATH-102953	Algebraic Topology II (S. 49)	8	Roman Sauer
M-MATH-102902	Asymptotic Stochastics (S. 50)	8	Norbert Henze
M-MATH-103259	Bifurcation Theory (S. 51)	5	Rainer Mandel
M-MATH-104349	Bott Periodicity (S. 52)	5	
M-MATH-102871	Boundary and Eigenvalue Problems (S. 53)	8	Wolfgang Reichel
M-MATH-102904	Brownian Motion (S. 54)	4	Nicole Bäuerle
M-MATH-102882	Calculus of Variations (S. 55)	8	Wolfgang Reichel
M-MATH-102870	Classical Methods for Partial Differential Equations (S. 56)	8	Michael Plum
M-MATH-102950	Combinatorics (S. 57)	8	Maria Aksenovich
M-MATH-104053	Commutative Algebra (S. 58)	8	Frank Herrlich
M-MATH-102940	Comparison Geometry (S. 59)	5	Wilderich Tuschmann
M-MATH-104426	Comparison of numerical integrators for nonlinear dispersive equations (S. 60)	4	Katharina Schratz
M-MATH-102878	Complex Analysis (S. 61)	8	Christoph Schmoeger
M-MATH-102935	Compressive Sensing (S. 62)	5	Andreas Rieder
M-MATH-102883	Computer-Assisted Analytical Methods for Boundary and Eigenvalue Problems (S. 63)	8	Michael Plum
M-MATH-102860	Continuous Time Finance (S. 64)	8	Nicole Bäuerle
M-MATH-102941	Control Theory (S. 65)	6	Roland Schnaubelt
M-MATH-102864	Convex Geometry (S. 66)	8	Daniel Hug
M-MATH-101317	Differential Geometry (S. 67)	8	Wilderich Tuschmann
M-MATH-102919	Discrete Time Finance (S. 68)	8	Nicole Bäuerle
M-MATH-104425	Dispersive equations (S. 69)	6	Wolfgang Reichel
M-MATH-103080	Dynamical Systems (S. 70)	8	Jens Rottmann-Matthes
M-MATH-102872	Evolution Equations (S. 71)	8	Roland Schnaubelt
M-MATH-103700	Exponential Integrators (S. 72)	6	Marlis Hochbruck
M-MATH-102957	Extremal Graph Theory (S. 73)	8	Maria Aksenovich
M-MATH-102939	Extreme Value Theory (S. 74)	4	Vicky Fasen-Hartmann
M-MATH-102891	Finite Element Methods (S. 75)	8	Willy Dörfler,Christian Wieners
M-MATH-103258	Finite group schemes (S. 76)	4	Frank Herrlich,Fabian Januszewski
M-MATH-102956	Forecasting: Theory and Practice (S. 77)	8	Tilmann Gneiting
M-MATH-103527	Foundations of continuum mechanics (S. 78)	3	Christian Wieners
M-MATH-102873	Fourier Analysis (S. 79)	8	Lutz Weis
M-MATH-101320	Functional Analysis (S. 80)	8	Roland Schnaubelt
M-MATH-102937	Functions of Matrices (S. 81)	8	Volker Grimm
M-MATH-102936	Functions of Operators (S. 82)	6	Volker Grimm
M-MATH-102906	Generalized Regression Models (S. 83)	4	Bernhard Klar
M-MATH-102867	Geometric Group Theory (S. 84)	8	Roman Sauer
M-MATH-102921	Geometric Numerical Integration (S. 85)	6	Tobias Jahnke
M-MATH-102866	Geometry of Schemes (S. 86)	8	Frank Herrlich

M-MATH-102912	Global Differential Geometry (S. 87)	8	Wilderich Tuschmann
M-MATH-101336	Graph Theory (S. 88)	8	Maria Aksenovich
M-MATH-102954	Group Actions in Riemannian Geometry (S. 89)	5	Wilderich Tuschmann
M-MATH-103545	Harmonic Analysis for Dispersive Equations (S. 90)	8	Peer Kunstmann
M-MATH-102959	Homotopy Theory (S. 91)	8	Roman Sauer
M-MATH-102874	Integral Equations (S. 92)	8	Frank Hettlich
M-MATH-102943	Introduction into Particulate Flows (S. 93)	3	Willy Dörfler
M-MATH-102949	Introduction to Geometric Measure Theory (S. 94)	6	Steffen Winter
M-MATH-103919	Introduction to Kinetic Theory (S. 95)	4	Martin Frank
M-MATH-102945	Introduction to Matlab and Numerical Algorithms (S. 96)	5	Daniel Weiß
M-MATH-102889	Introduction to Scientific Computing (S. 97)	8	Willy Dörfler, Tobias Jahnke
M-MATH-102890	Inverse Problems (S. 98)	8	Andreas Kirsch
M-MATH-104057	Key Moments in Geometry (S. 99)	5	Wilderich Tuschmann
M-MATH-102952	L2-Invariants (S. 100)	5	Holger Kammeyer
M-MATH-104261	Lie groups and Lie algebras (S. 101)	8	Enrico Leuzinger
M-MATH-102907	Markov Decision Processes (S. 102)	5	Nicole Bäuerle
M-MATH-102897	Mathematical Methods in Signal and Image Processing (S. 104)	8	Andreas Rieder
M-MATH-103260	Mathematical Methods of Imaging (S. 105)	5	Andreas Rieder
M-MATH-102929	Mathematical Modelling and Simulation in Practise (S. 106)	4	Gudrun Thäter
M-MATH-102909	Mathematical Statistics (S. 107)	4	Bernhard Klar
M-MATH-104059	Mathematical Topics in Kinetic Theory (S. 108)	4	Dirk Hundertmark
M-MATH-102885	Maxwell's Equations (S. 109)	8	Andreas Kirsch
M-MATH-102896	Medical Imaging (S. 110)	8	Andreas Rieder
M-MATH-103539	Nonlinear Analysis (S. 111)	8	Tobias Lamm
M-MATH-103257	Nonlinear Maxwell Equations (S. 112)	3	Roland Schnaubelt
M-MATH-102910	Nonparametric Statistics (S. 113)	4	Norbert Henze
M-MATH-102944	Numerical Continuation Methods (S. 114)	5	Jens Rottmann-Matthes
M-MATH-103709	Numerical Linear Algebra for Scientific High Performance Computing (S. 115)	3	Hartwig Anzt
M-MATH-104058	Numerical Linear Algebra in Image Processing (S. 116)	6	Volker Grimm
M-MATH-102888	Numerical Methods for Differential Equations (S. 117)	8	Willy Dörfler, Tobias Jahnke
M-MATH-102915	Numerical Methods for Hyperbolic Equations (S. 118)	6	Willy Dörfler
M-MATH-102930	Numerical Methods for Integral Equations (S. 119)	8	Tilo Arens
M-MATH-102931	Numerical Methods for Maxwell's Equations (S. 120)	6	Marlis Hochbruck, Tobias Jahnke
M-MATH-102928	Numerical Methods for Time-Dependent Partial Differential Equations (S. 121)	8	Marlis Hochbruck
M-MATH-102894	Numerical Methods in Computational Electrodynamics (S. 122)	6	Willy Dörfler
M-MATH-102932	Numerical Methods in Fluid Mechanics (S. 123)	4	Willy Dörfler, Gudrun Thäter
M-MATH-102901	Numerical Methods in Mathematical Finance (S. 124)	8	Tobias Jahnke
M-MATH-102914	Numerical Methods in Mathematical Finance II (S. 125)	8	Tobias Jahnke
M-MATH-102892	Numerical Optimisation Methods (S. 126)	8	Christian Wieners
M-MATH-102899	Optimisation and Optimal Control for Differential Equations (S. 127)	4	Christian Wieners
M-MATH-102924	Optimization in Banach Spaces (S. 128)	8	Andreas Kirsch
M-MATH-101338	Parallel Computing (S. 129)	5	Mathias Krause, Christian Wieners
M-MATH-102905	Percolation (S. 130)	6	Günter Last
M-MATH-102922	Poisson Processes (S. 131)	5	Günter Last
M-MATH-102879	Potential Theory (S. 132)	8	Andreas Kirsch
M-MATH-102947	Probability Theory and Combinatorial Optimization (S. 133)	8	Daniel Hug

M-MATH-102938	Project Centered Software-Lab (S. 134)	4	Gudrun Thäter
M-MATH-102951	Random Graphs (S. 135)	6	Matthias Schulte
M-MATH-103256	Rational Homotopy Theory (S. 136)	4	Manuel Amann,Roman Sauer
M-MATH-104055	Ruin theory (S. 137)	4	Vicky Fasen-Hartmann
M-MATH-102926	Sobolev Spaces (S. 140)	5	Andreas Kirsch
M-MATH-102903	Spatial Stochastics (S. 141)	8	Günter Last
M-MATH-101335	Special Functions and Applications in Potential Theory (S. 142)	5	Andreas Kirsch
M-MATH-104435	Special Topics in Harmonic Analysis (S. 143)	3	Dirk Hundertmark
M-MATH-102920	Special Topics of Numerical Linear Algebra (S. 144)	8	Marlis Hochbruck
M-MATH-101768	Spectral Theory (S. 145)	8	Lutz Weis
M-MATH-102958	Spin Manifolds, Alpha Invariant and Positive Scalar Curvature (S. 146)	5	Wilderich Tuschmann
M-MATH-102946	Stein's Method (S. 147)	5	Matthias Schulte
M-MATH-102908	Stochastic Control (S. 148)	4	Nicole Bäuerle
M-MATH-102881	Stochastic Differential Equations (S. 149)	8	Lutz Weis
M-MATH-102942	Stochastic Evolution Equations (S. 150)	8	Lutz Weis
M-MATH-102865	Stochastic Geometry (S. 151)	8	Daniel Hug
M-MATH-102911	Time Series Analysis (S. 152)	4	Bernhard Klar
M-MATH-103543	Topics in number theory: class field theory and zeta-functions (S. 153)	8	Claus-Günther Schmidt
M-MATH-102927	Traveling Waves (S. 154)	6	Jens Rottmann-Matthes
M-MATH-104054	Uncertainty Quantification (S. 155)	4	Martin Frank
M-MATH-102895	Wavelets (S. 156)	8	Andreas Rieder
M-WIWI-103119	Advanced Topics in Strategy and Management (S. 157)	9	Hagen Lindstädt
M-WIWI-101637	Analytics and Statistics (S. 159)	9	Oliver Grothe
M-WIWI-101413	Applications of Operations Research (S. 161)	9	Stefan Nickel
M-WIWI-101504	Collective Decision Making (S. 163)	9	Clemens Puppe
M-WIWI-102970	Decision and Game Theory (S. 164)	9	Clemens Puppe
M-WIWI-101638	Econometrics and Statistics I (S. 166)	9	Melanie Schienle
M-WIWI-101639	Econometrics and Statistics II (S. 167)	9	Melanie Schienle
M-WIWI-101502	Economic Theory and its Application in Finance (S. 169)	9	Kay Mitusch
M-WIWI-101452	Energy Economics and Technology (S. 172)	9	Wolf Fichtner
M-WIWI-101505	Experimental Economics (S. 174)	9	Johannes Philipp Reiß
M-WIWI-101482	Finance 1 (S. 175)	9	Martin Ruckes,Marliese Uhrig-Homburg
M-WIWI-101483	Finance 2 (S. 176)	9	Martin Ruckes,Marliese Uhrig-Homburg
M-WIWI-101480	Finance 3 (S. 178)	9	Martin Ruckes,Marliese Uhrig-Homburg
M-WIWI-101496	Growth and Agglomeration (S. 180)	9	Ingrid Ott
M-WIWI-101472	Informatics (S. 181)	9	Andreas Oberweis,Harald Sack,York Sure-Vetter,Johann Marius Zöllner
M-WIWI-104068	Information Systems in Organizations (S. 183)	9	Alexander Mädche
M-WIWI-101478	Innovation and Growth (S. 185)	9	Ingrid Ott
M-WIWI-101469	Insurance Management I (S. 187)	9	Ute Werner
M-WIWI-103247	Intelligent Risk and Investment Advisory (S. 189)	9	Maxim Ulrich
M-WIWI-101490	Marketing Management (S. 190)	9	Martin Klarmann
M-WIWI-101473	Mathematical Programming (S. 192)	9	Oliver Stein
M-WIWI-101414	Methodical Foundations of OR (S. 194)	9	Oliver Stein
M-WIWI-101500	Microeconomic Theory (S. 196)	9	Clemens Puppe
M-WIWI-102832	Operations Research in Supply Chain Management (S. 197)	9	Stefan Nickel
M-WIWI-102805	Service Operations (S. 205)	9	Stefan Nickel
M-WIWI-103289	Stochastic Optimization (S. 207)	9	Steffen Rebennack

Part IV
Modules

M Module: The Riemann Zeta Function [M-MATH-102960]

Responsibility: Fabian Januszewski

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
4	Irregular	1 term	German	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105934	The Riemann Zeta Function (S. 502)	4	Fabian Januszewski

M Module: Adaptive finite element methods [M-MATH-104060]

Responsibility: Tobias Jahnke

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108404	Adaptive finite element methods (S. 210)	8	Tobias Jahnke

Conditions
None

M Module: Adaptive Finite Elemente Methods [M-MATH-102900]

Responsibility: Willy Dörfler

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105898	Adaptive Finite Element Methods (S. 211)	6	Willy Dörfler

Conditions
none

M Module: Advanced Inverse Problems: Nonlinearity and Banach Spaces [M-MATH-102955]

Responsibility: Andreas Rieder

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105927	Advanced Inverse Problems: Nonlinearity and Banach Spaces (S. 213)	5	Andreas Rieder

Conditions
none

M Module: Algebra [M-MATH-101315]

Responsibility: Frank Herrlich

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each winter term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-102253	Algebra (S. 223)	8	Frank Herrlich, Stefan Kühnlein

Conditions

None

M Module: Algebraic Geometry [M-MATH-101724]

Responsibility: Frank Herrlich

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-103340	Algebraic Geometry (S. 224)	8	Frank Herrlich, Stefan Kühnlein

M Module: Algebraic Number Theory [M-MATH-101725]

Responsibility: Stefan Kühnlein

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-103346	Algebraic Number Theory (S. 225)	8	Stefan Kühnlein

M Module: Algebraic Topology [M-MATH-102948]

Responsibility: Roman Sauer

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105915	Algebraic Topology (S. 226)	8	Holger Kammeyer, Roman Sauer

Conditions
none

M Module: Algebraic Topology II [M-MATH-102953]

Responsibility: Roman Sauer

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105926	Algebraic Topology II (S. 227)	8	Roman Sauer

Conditions
none

M Module: Asymptotic Stochastics [M-MATH-102902]

Responsibility: Norbert Henze

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each winter term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105866	Asymptotic Stochastics (S. 231)	8	Vicky Fasen-Hartmann, Norbert Henze, Bernhard Klar

Conditions

none

M Module: Bifurcation Theory [M-MATH-103259]

Responsibility: Rainer Mandel

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-106487	Bifurcation Theory (S. 234)	5	Rainer Mandel

Conditions
None

Remarks
Course is held in English

M Module: Bott Periodicity [M-MATH-104349]

Responsibility:

Organisation:	KIT-Fakultät für Mathematik
Curricular Anchorage:	Compulsory Elective
Contained in:	Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108905	Bott Periodicity (S. 237)	5	Wilderich Tuschmann

Conditions
None

M Module: Boundary and Eigenvalue Problems [M-MATH-102871]

Responsibility: Wolfgang Reichel

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each summer term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105833	Boundary and Eigenvalue Problems (S. 238)	8	Dirk Hundertmark, Tobias Lamm, Michael Plum, Wolfgang Reichel, Jens Rottmann-Matthes, Roland Schnaubelt, Lutz Weis

M Module: Brownian Motion [M-MATH-102904]

Responsibility: Nicole Bäuerle

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105868	Brownian Motion (S. 239)	4	Nicole Bäuerle, Vicky Fasen-Hartmann, Günter Last

Conditions
none

M Module: Calculus of Variations [M-MATH-102882]

Responsibility: Wolfgang Reichel

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105853	Calculus of Variations (S. 246)	8	Andreas Kirsch, Tobias Lamm, Michael Plum, Wolfgang Reichel

M Module: Classical Methods for Partial Differential Equations [M-MATH-102870]

Responsibility: Michael Plum

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each winter term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105832	Classical Methods for Partial Differential Equations (S. 248)	8	Dirk Hundertmark, Tobias Lamm, Michael Plum, Wolfgang Reichel, Jens Rottmann-Matthes, Roland Schnaubelt, Lutz Weis

M Module: Combinatorics [M-MATH-102950]

Responsibility:	Maria Aksenovich
Organisation:	KIT-Fakultät für Mathematik
Curricular Anchorage:	Compulsory Elective
Contained in:	Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105916	Combinatorics (S. 249)	8	Maria Aksenovich

Learning Control / Examinations

The final grade is given based on the written final exam (3h).
By successfully working on the problem sets, a bonus can be obtained. If the grade in the final written exam is between 4,0 and 1,3, then the bonus improves the grade by one step (0,3 or 0,4).

Conditions

none

Qualification Objectives

The students understand, describe, and use fundamental notions and techniques in combinatorics. They can analyze, structure, and formally describe typical combinatorial questions. The students can use the results and methods such as inclusion-exclusion, generating functions, Young tableaux, as well as the developed proof ideas, in solving combinatorial problems. In particular, they can analyze the existence and the number of ordered and unordered arrangements of a given size. The students understand and critically use the combinatorial methods. Moreover, the students can communicate using English technical terminology.

Content

The course is an introduction into combinatorics. Starting with counting problems and bijections, classical methods such as inclusion-exclusion principle and generating functions are discussed. Further topics include Catalan families, permutations, Young tableaux, partial orders, and combinatorial designs.

Remarks

- Regular cycle: every 2nd year, summer semester
- Course is held in English

M Module: Commutative Algebra [M-MATH-104053]

Responsibility: Frank Herrlich

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108398	Commutative Algebra (S. 250)	8	Frank Herrlich

Conditions

None

M Module: Comparison Geometry [M-MATH-102940]

Responsibility: Wilderich Tuschmann

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105917	Comparison Geometry (S. 251)	5	Wilderich Tuschmann

Conditions
none

M Module: Comparison of numerical integrators for nonlinear dispersive equations [M-MATH-104426]

Responsibility: Katharina Schratz

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-109040	Comparison of numerical integrators for nonlinear dispersive equations (S. 252)	4	Katharina Schratz

Conditions
None

Content
We will compare numerical integrators (e.g., splitting methods, exponential integrators) for nonlinear dispersive equations such as the nonlinear Schrödinger equation and Kortweg-de Vries equation. We will analyze their convergence properties with regard to the regularity assumptions on the solution.

M Module: Complex Analysis [M-MATH-102878]

Responsibility: Christoph Schmoeger

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105849	Complex Analysis (S. 253)	8	Gerd Herzog, Michael Plum, Wolfgang Reichel, Christoph Schmoeger, Roland Schnaubelt, Lutz Weis

Content

- infinite products
- Mittag-Leffler theorem
- Montel's theorem
- Riemann mapping theorem
- conformal mappings
- univalent (schlicht) functions
- automorphisms of some domains
- harmonic functions
- Schwarz reflection principle
- regular and singular points of power series

M Module: Compressive Sensing [M-MATH-102935]

Responsibility: Andreas Rieder

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105894	Compressive Sensing (S. 254)	5	Andreas Rieder

M Module: Computer-Assisted Analytical Methods for Boundary and Eigenvalue Problems [M-MATH-102883]

Responsibility:	Michael Plum
Organisation:	KIT-Fakultät für Mathematik
Curricular Anchorage:	Compulsory Elective
Contained in:	Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis Mathematical Methods / Elective Field Mathematical Methods / Analysis Elective Field Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105854	Computer-Assisted Analytical Methods for Boundary and Eigenvalue Problems (S. 260)	8	Michael Plum

M Module: Continuous Time Finance [M-MATH-102860]

Responsibility: Nicole Bäuerle

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each summer term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105930	Continuous Time Finance (S. 261)	8	Nicole Bäuerle, Vicky Fasen-Hartmann

M Module: Control Theory [M-MATH-102941]

Responsibility: Roland Schnaubelt

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105909	Control Theory (S. 262)	6	Roland Schnaubelt, Lutz Weis

Conditions
none

M Module: Convex Geometry [M-MATH-102864]

Responsibility: Daniel Hug

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105831	Convex Geometry (S. 264)	8	Daniel Hug

Qualification Objectives
The students

- know fundamental combinatorial, geometric and analytic properties of convex sets and convex functions and apply these to related problems,
- are familiar with fundamental geometric and analytic inequalities for functionals of convex sets and their applications to geometric extremal problems and can present central ideas and techniques of proofs,
- know selected integral formulas for convex sets and the required results on invariant measures.
- know how to work self-organized and self-reflexive.

Content
1. Convex Sets
1.1. Combinatorial Properties
1.2. Support and Separation Properties
1.3. Extremal Representations
2. Convex Functions
2.1. Basic Properties
2.2. Regularity
2.3. Support Function
3. Brunn-Minkowski Theory
3.1. Hausdorff Metric
3.2. Volume and Surface Area
3.3. Mixed Volumes
3.4. Geometric Inequalities
3.5. Surface Area Measures
3.6. Projection Functions
4. Integralgeometric Formulas
4.1. Invariant Measures
4.2. Projection and Section Formulas

M Module: Differential Geometry [M-MATH-101317]

Responsibility: Wilderich Tuschmann

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each summer term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-102275	Differential Geometry (S. 276)	8	Sebastian Grensing, Enrico Leuzinger, Wilderich Tuschmann

Conditions
None

M Module: Discrete Time Finance [M-MATH-102919]

Responsibility:	Nicole Bäuerle
Organisation:	KIT-Fakultät für Mathematik
Curricular Anchorage:	Compulsory Elective
Contained in:	Mathematical Methods / Stochastics Mathematical Methods / Elective Field Mathematical Methods / Stochastics Elective Field Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each winter term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105839	Discrete Time Finance (S. 279)	8	Nicole Bäuerle, Vicky Fasen-Hartmann

Conditions

none

M Module: Dispersive equations [M-MATH-104425]

Responsibility: Wolfgang Reichel

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-109001	Dispersive equations (S. 282)	6	Wolfgang Reichel

Conditions
None

M Module: Dynamical Systems [M-MATH-103080]

Responsibility:	Jens Rottmann-Matthes
Organisation:	KIT-Fakultät für Mathematik
Curricular Anchorage:	Compulsory Elective
Contained in:	Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis Mathematical Methods / Elective Field Mathematical Methods / Analysis Elective Field Additional Examinations

ECTS	Recurrence	Duration	Language	Version
8	Irregular	1 term	German	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-106114	Dynamical Systems (S. 284)	8	Jens Rottmann-Matthes

Conditions

none

M Module: Evolution Equations [M-MATH-102872]

Responsibility: Roland Schnaubelt

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105844	Evolution Equations (S. 298)	8	Roland Schnaubelt, Lutz Weis

M Module: Exponential Integrators [M-MATH-103700]

Responsibility: Marlis Hochbruck

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-107475	Exponential Integrators (S. 301)	6	Marlis Hochbruck

Learning Control / Examinations
Oral exam of approximately 20 minutes

Conditions
None

Content
In this class we consider the construction, analysis, implementation and application of exponential integrators. The focus will be on two types of stiff problems.
The first one is characterized by a Jacobian that possesses eigenvalues with large negative real parts. Parabolic partial differential equations and their spatial discretization are typical examples. The second class consists of highly oscillatory problems with purely imaginary eigenvalues of large modulus.
Apart from motivating the construction of exponential integrators for various classes of problems, our main intention in this class is to present the mathematics behind these methods. We will derive error bounds that are independent of stiffness or highest frequencies in the system.
Since the implementation of exponential integrators requires the evaluation of the product of a matrix function with a vector, we will briefly discuss some possible approaches as well.

M Module: Extremal Graph Theory [M-MATH-102957]

Responsibility: Maria Aksenovich

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
8	Irregular	1 term	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105931	Extremal Graph Theory (S. 302)	8	Maria Aksenovich

Learning Control / Examinations
The final grade is given based on an oral exam (approx. 30 min.).

Qualification Objectives
The students understand, describe, and use fundamental notions and techniques in extremal graph theory. They can analyze, structure, and formally describe typical combinatorial questions. The students understand and use Szemeredi's regularity lemma and Szemeredi's theorem, can use probabilistic techniques, such as dependent random choice and multistep random colorings, know the best bounds for the extremal numbers of complete graphs, cycles, complete bipartite graphs, and bipartite graphs with bounded maximum degree. They understand and can use the Ramsey theorem for graphs and hypergraphs, as well as stepping-up techniques for bounding Ramsey numbers. Moreover, the students know and understand the behavior of Ramsey numbers for graphs with bounded maximum degree. The students can communicate using English technical terminology.

Content
The course is concerned with advanced topics in graph theory. It focuses on the areas of extremal functions, regularity, and Ramsey theory for graphs and hypergraphs. Further topics include Turán's theorem, Erdös-Stone theorem, Szemerédi's lemma, graph colorings and probabilistic techniques.

Recommendations
Basic knowledge of linear algebra, analysis and graph theory is recommended.

Remarks
Course is held in English

M Module: Extreme Value Theory [M-MATH-102939]

Responsibility: Vicky Fasen-Hartmann

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105908	Extreme Value Theory (S. 303)	4	Vicky Fasen-Hartmann, Norbert Henze

Conditions
None

M Module: Finite Element Methods [M-MATH-102891]

Responsibility: Willy Dörfler, Christian Wieners

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each winter term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105857	Finite Element Methods (S. 309)	8	Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners

M Module: Finite group schemes [M-MATH-103258]

Responsibility: Frank Herrlich, Fabian Januszewski

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
4	Once	1 term	German	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-106486	Finite group schemes (S. 310)	4	Fabian Januszewski

M Module: Forecasting: Theory and Practice [M-MATH-102956]

Responsibility: Tilmann Gneiting

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
8	Irregular	2 terms	English	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105928	Forecasting: Theory and Practice (S. 312)	8	Tilmann Gneiting

Conditions
None

Remarks

- Regular cycle: every 2nd year, starting winter semester 16/17
- Course is held in English

M Module: Foundations of continuum mechanics [M-MATH-103527]

Responsibility: Christian Wieners

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
3	Once	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-107044	Foundations of continuum mechanics (S. 313)	3	Christian Wieners

Conditions
none

M Module: Fourier Analysis [M-MATH-102873]

Responsibility: Lutz Weis

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105845	Fourier Analysis (S. 314)	8	Roland Schnaubelt, Lutz Weis

Content

- Fourier series
- Fourier transform on L1 and L2
- Tempered distributions and their Fourier transform
- Explizit solutions of the Heat-, Schrödinger- and Wave equation in Rn
- the Hilbert transform
- the interpolation theorem of Marcinkiewicz
- Singular integral operators
- the Fourier multiplier theorem of Mihlin

M Module: Functional Analysis [M-MATH-101320]

Responsibility: Roland Schnaubelt

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each winter term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-102255	Functional Analysis (S. 315)	8	Gerd Herzog, Dirk Hundertmark, Tobias Lamm, Michael Plum, Wolfgang Reichel, Christoph Schmoeger, Roland Schnaubelt, Lutz Weis

Conditions
None

M Module: Functions of Matrices [M-MATH-102937]

Responsibility: Volker Grimm

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105906	Functions of Matrices (S. 316)	8	Volker Grimm

Conditions
none

M Module: Functions of Operators [M-MATH-102936]

Responsibility: Volker Grimm

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105905	Functions of Operators (S. 317)	6	

M Module: Generalized Regression Models [M-MATH-102906]

Responsibility: Bernhard Klar

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Each summer term	1 term	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105870	Generalized Regression Models (S. 318)	4	Norbert Henze, Bernhard Klar

Conditions
None

M Module: Geometric Group Theory [M-MATH-102867]

Responsibility: Roman Sauer

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105842	Geometric Group Theory (S. 319)	8	Frank Herrlich, Enrico Leuzinger, Gabriele Link, Roman Sauer, Petra Schwer, Wilderich Tuschmann

M Module: Geometric Numerical Integration [M-MATH-102921]

Responsibility: Tobias Jahnke

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105919	Geometric Numerical Integration (S. 320)	6	Marlis Hochbruck, Tobias Jahnke

Conditions
none

M Module: Geometry of Schemes [M-MATH-102866]

Responsibility: Frank Herrlich

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105841	Geometry of Schemes (S. 321)	8	Frank Herrlich, Stefan Kühnlein

M Module: Global Differential Geometry [M-MATH-102912]

Responsibility: Wilderich Tuschmann

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105885	Global Differential Geometry (S. 322)	8	Sebastian Grensing, Wilderich Tuschmann

Conditions

none

M Module: Graph Theory [M-MATH-101336]

Responsibility: Maria Aksenovich

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
8	Irregular	1 term	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-102273	Graph Theory (S. 329)	8	Maria Aksenovich

Learning Control / Examinations
The final grade is given based on the written final exam (3h).
By successfully working on the problem sets, a bonus can be obtained. If the grade in the final written exam is between 4,0 and 1,3, then the bonus improves the grade by one step (0,3 or 0,4).

Conditions
None

Qualification Objectives
The students understand, describe and use fundamental notions and techniques in graph theory. They can represent the appropriate mathematical questions in terms of graphs and use the results such as Menger's theorem, Kuratowski's theorem, Turan's theorem, as well as the developed proof ideas, to solve these problems. The students can analyze graphs in terms of their characteristics such as connectivity, planarity, and chromatic number. They are well positioned to understand graph theoretic methods and use them critically. Moreover, the students can communicate using English technical terminology.

Content
The course Graph Theory treats the fundamental properties of graphs, starting with basic ones introduced by Euler and including the modern results obtained in the last decade. The following topics are covered: structure of trees, paths, cycles and walks in graphs, minors, unavoidable subgraphs in dense graphs, planar graphs, graph coloring, Ramsey theory, and regularity in graphs.

Remarks

- Regular cycle: every 2nd year, winter semester
- Course is held in English

M Module: Group Actions in Riemannian Geometry [M-MATH-102954]

Responsibility: Wilderich Tuschmann

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105925	Group Actions in Riemannian Geometry (S. 331)	5	Wilderich Tuschmann

Conditions
none

M Module: Harmonic Analysis for Dispersive Equations [M-MATH-103545]

Responsibility: Peer Kunstmann

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-107071	Harmonic Analysis for Dispersive Equations (S. 332)	8	Peer Kunstmann

Conditions
None

Content
Fourier transform, Fourier multipliers, interpolation, singular integral operators, Mihlin's Theorem, Littlewood-Paley decomposition, oscillating integrals, dispersive estimates, Strichartz estimates, nonlinear equations.

M Module: Homotopy Theory [M-MATH-102959]

Responsibility: Roman Sauer

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
8	Irregular	1 term	German	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105933	Homotopy Theory (S. 334)	8	Roman Sauer

M Module: Integral Equations [M-MATH-102874]

Responsibility: Frank Hettlich

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105834	Integral Equations (S. 346)	8	Tilo Arens, Frank Hettlich, Andreas Kirsch

M Module: Introduction into Particulate Flows [M-MATH-102943]

Responsibility: Willy Dörfler

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
3	Once	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105911	Introduction into Particulate Flows (S. 349)	3	Willy Dörfler

Conditions
none

M Module: Introduction to Geometric Measure Theory [M-MATH-102949]

Responsibility: Steffen Winter

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105918	Introduction to Geometric Measure Theory (S. 350)	6	Steffen Winter

Conditions
none

M Module: Introduction to Kinetic Theory [M-MATH-103919]

Responsibility: Martin Frank

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
4	Each winter term	1 term	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108013	Introduction to Kinetic Theory (S. 351)	4	Martin Frank

Conditions
None

Qualification Objectives
After successfully taking part in the module's classes and exams, students have gained knowledge and abilities as described in the "Inhalt" section. Specifically, Students know common means of mesoscopic and macroscopic description of particle systems. Furthermore, students are able to describe the basics of multiscale methods, such as the asypmtotic analysis and the method of moments. Students are able to apply numerical methods to solve engineering problems related to particle systems. They can name the assumptions that are needed to be made in the process. Students can judge whether specific models are applicable to the specific problem and discuss their results with specialists and colleagues.

Content

- From Newton's equations to Boltzmann's equation
- Rigorous derivation of the linear Boltzmann equation
- Properties of kinetic equations (existence & uniqueness, H theorem)
- The diffusion limit
- From Boltzmann to Euler & Navier-Stokes
- Method of Moments
- Closure techniques
- Selected numerical methods

Recommendations
Partial Differential Equations, Functional Analysis

M Module: Introduction to Matlab and Numerical Algorithms [M-MATH-102945]

Responsibility: Daniel Weiß

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105913	Introduction to Matlab and Numerical Algorithms (S. 352)	5	Daniel Weiß, Christian Wieners

Conditions
none

M Module: Introduction to Scientific Computing [M-MATH-102889]

Responsibility: Willy Dörfler, Tobias Jahnke

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each summer term	1 term	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105837	Introduction to Scientific Computing (S. 353)	8	Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners

Conditions
None

M Module: Inverse Problems [M-MATH-102890]

Responsibility: Andreas Kirsch

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each winter term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105835	Inverse Problems (S. 355)	8	Tilo Arens, Frank Hettlich, Andreas Kirsch, Andreas Rieder

M Module: Key Moments in Geometry [M-MATH-104057]

Responsibility: Wilderich Tuschmann

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108401	Key Moments in Geometry (S. 356)	5	Wilderich Tuschmann

Conditions
None

M Module: L2-Invariants [M-MATH-102952]

Responsibility: Holger Kammeyer

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105924	L2-Invariants (S. 358)	5	Holger Kammeyer, Roman Sauer

Conditions
none

M Module: Lie groups and Lie algebras [M-MATH-104261]

Responsibility: Enrico Leuzinger

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
8	Irregular	1 term	German	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108799	Lie groups and Lie algebras (S. 360)	8	Enrico Leuzinger

M Module: Markov Decision Processes [M-MATH-102907]

Responsibility: Nicole Bäuerle

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105921	Markov Decision Processes (S. 368)	5	Nicole Bäuerle

Conditions
none

M Module: Master Thesis [M-MATH-102917]

Responsibility: Sebastian Grensing

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory

Contained in: Master Thesis

ECTS	Recurrence	Duration	Version
30	Each term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105878	Master Thesis (S. 369)	30	Sebastian Grensing

M Module: Mathematical Methods in Signal and Image Processing [M-MATH-102897]

Responsibility: Andreas Rieder

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105862	Mathematical Methods in Signal and Image Processing (S. 370)	8	Andreas Rieder

Conditions
none

M Module: Mathematical Methods of Imaging [M-MATH-103260]

Responsibility: Andreas Rieder

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-106488	Mathematical Methods of Imaging (S. 371)	5	Andreas Rieder

Conditions
None

M Module: Mathematical Modelling and Simulation in Practise [M-MATH-102929]

Responsibility: Gudrun Thäter

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
4	Irregular	1 term	English	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105889	Mathematical Modelling and Simulation in Practise (S. 372)	4	Gudrun Thäter

Conditions
None

M Module: Mathematical Statistics [M-MATH-102909]

Responsibility: Bernhard Klar

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105872	Mathematical Statistics (S. 373)	4	Norbert Henze, Bernhard Klar

Conditions
none

M Module: Mathematical Topics in Kinetic Theory [M-MATH-104059]

Responsibility: Dirk Hundertmark

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108403	Mathematical Topics in Kinetic Theory (S. 374)	4	Dirk Hundertmark

Conditions
None

Qualification Objectives
The students are familiar with the basic questions in kinetic theory and methodical approaches to their solutions. With the acquired knowledge they are able to understand the required analytical methods and are able to apply them to the basic equations in kinetic theory.

Content

- Boltzmann equation: Cauchy problem and properties of solutions
- entropy and H theorem
- equilibrium and convergence to equilibrium
- other models of kinetic theory

M Module: Maxwell's Equations [M-MATH-102885]

Responsibility:	Andreas Kirsch
Organisation:	KIT-Fakultät für Mathematik
Curricular Anchorage:	Compulsory Elective
Contained in:	Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization Mathematical Methods / Elective Field Mathematical Methods / Analysis Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization Elective Field Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105856	Maxwell's Equations (S. 375)	8	Tilo Arens, Frank Hettlich, Andreas Kirsch

M Module: Medical Imaging [M-MATH-102896]

Responsibility: Andreas Rieder

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105861	Medical Imaging (S. 376)	8	Andreas Rieder

Conditions
None

M Module: Nonlinear Analysis [M-MATH-103539]

Responsibility: Tobias Lamm

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-107065	Nonlinear Analysis (S. 386)	8	Tobias Lamm

Conditions
None

M Module: Nonlinear Maxwell Equations [M-MATH-103257]

Responsibility: Roland Schnaubelt

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
3	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-106484	Nonlinear Maxwell Equations (S. 387)	3	Roland Schnaubelt

Conditions

none

Content

- Short introduction to nonlinear contraction semigroups in Hilbert spaces and to the spaces H(curl) and H(div).
- Semilinear case:
  Maxwell's equations with linear material laws and nonlinear conductivity. Wellposedness by means of maximal monotone operators. Long-term behavior.
- Quasilinear case:
  Maxwell's equations with nonlinear instantaneous material laws. Local wellposedness on the whole space via linearisation, apriori estimates and regularization. Blow-up examples. Outlook to results on domains.

M Module: Nonparametric Statistics [M-MATH-102910]

Responsibility: Norbert Henze

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105873	Nonparametric Statistics (S. 394)	4	Norbert Henze, Bernhard Klar

Conditions
None

M Module: Numerical Continuation Methods [M-MATH-102944]

Responsibility: Jens Rottmann-Matthes

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105912	Numerical Continuation Methods (S. 395)	5	Jens Rottmann-Matthes

Conditions
none

M Module: Numerical Linear Algebra for Scientific High Performance Computing [M-MATH-103709]

Responsibility: Hartwig Anzt

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
3	Irregular	1 term	English	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-107497	Numerical Linear Algebra for Scientific High Performance Computing (S. 396)	3	Hartwig Anzt

Conditions
None

M Module: Numerical Linear Algebra in Image Processing [M-MATH-104058]

Responsibility: Volker Grimm

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108402	Numerical Linear Algebra in Image Processing (S. 397)	6	Volker Grimm

Conditions
None

M Module: Numerical Methods for Differential Equations [M-MATH-102888]

Responsibility: Willy Dörfler, Tobias Jahnke

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each winter term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105836	Numerical Methods for Differential Equations (S. 398)	8	Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners

M Module: Numerical Methods for Hyperbolic Equations [M-MATH-102915]

Responsibility: Willy Dörfler

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105900	Numerical Methods for Hyperbolic Equations (S. 399)	6	Willy Dörfler

Conditions
none

Qualification Objectives
.

M Module: Numerical Methods for Integral Equations [M-MATH-102930]

Responsibility: Tilo Arens

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105901	Numerical Methods for Integral Equations (S. 400)	8	Tilo Arens, Frank Hettlich, Andreas Kirsch

M Module: Numerical Methods for Maxwell's Equations [M-MATH-102931]

Responsibility: Marlis Hochbruck, Tobias Jahnke

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105920	Numerical Methods for Maxwell's Equations (S. 401)	6	Marlis Hochbruck, Tobias Jahnke

M Module: Numerical Methods for Time-Dependent Partial Differential Equations [M-MATH-102928]

Responsibility: Marlis Hochbruck

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105899	Numerical Methods for Time-Dependent Partial Differential Equations (S. 402)	8	Marlis Hochbruck, Tobias Jahnke

M Module: Numerical Methods in Computational Electrodynamics [M-MATH-102894]

Responsibility: Willy Dörfler

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105860	Numerical Methods in Computational Electrodynamics (S. 403)	6	Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners

Conditions
none

M Module: Numerical Methods in Fluid Mechanics [M-MATH-102932]

Responsibility: Willy Dörfler, Gudrun Thäter

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105902	Numerical Methods in Fluid Mechanics (S. 404)	4	Willy Dörfler, Gudrun Thäter

M Module: Numerical Methods in Mathematical Finance [M-MATH-102901]

Responsibility: Tobias Jahnke

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105865	Numerical Methods in Mathematical Finance (S. 405)	8	Tobias Jahnke

Conditions
none

M Module: Numerical Methods in Mathematical Finance II [M-MATH-102914]

Responsibility: Tobias Jahnke

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105880	Numerical Methods in Mathematical Finance II (S. 406)	8	Tobias Jahnke

Conditions
none

M Module: Numerical Optimisation Methods [M-MATH-102892]

Responsibility: Christian Wieners

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105858	Numerical Optimisation Methods (S. 407)	8	Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners

M Module: Optimisation and Optimal Control for Differential Equations [M-MATH-102899]

Responsibility: Christian Wieners

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105864	Optimisation and Optimal Control for Differential Equations (S. 410)	4	

Conditions
none

M Module: Optimization in Banach Spaces [M-MATH-102924]

Responsibility: Andreas Kirsch

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105893	Optimization in Banach Spaces (S. 411)	8	Andreas Kirsch

Conditions
none

M Module: Parallel Computing [M-MATH-101338]

Responsibility: Mathias Krause, Christian Wieners

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-102271	Parallel Computing (S. 415)	5	Mathias Krause, Christian Wieners

Conditions
None

M Module: Percolation [M-MATH-102905]

Responsibility: Günter Last

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105869	Percolation (S. 417)	6	Günter Last

Conditions
none

Qualification Objectives
The students

- are acquainted with basic models of discrete and continuum percolation,
- acquire the skills needed to use specific probabilistic and graph-theoretical methods for the analysis of these models,
- know how to work self-organised and self-reflexive.

M Module: Poisson Processes [M-MATH-102922]

Responsibility:	Günter Last
Organisation:	KIT-Fakultät für Mathematik
Curricular Anchorage:	Compulsory Elective
Contained in:	Mathematical Methods / Stochastics Mathematical Methods / Elective Field Mathematical Methods / Stochastics Elective Field Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105922	Poisson Processes (S. 418)	5	Vicky Fasen-Hartmann, Daniel Hug, Günter Last

Learning Control / Examinations
oral exam

Module Grade
Marking: grade of exam

Conditions
none

Qualification Objectives
The students know about important properties of the Poisson process. The focus is on probabilistic methods and results which are independent of the specific phase space. The students understand the central role of the Poisson process as a specific point process and as a random measure.

Content

- Distributional properties of Poisson processes
- The Poisson process as a particular point process
- stationary Poisson and point processes
- Random measures and Cox processes
- Poisson cluster processes and compound Poisson processes
- The spatial Gale-Shapley algorithm

M Module: Potential Theory [M-MATH-102879]

Responsibility: Andreas Kirsch

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105850	Potential Theory (S. 420)	8	Tilo Arens, Frank Hettlich, Andreas Kirsch, Wolfgang Reichel

M Module: Probability Theory and Combinatorial Optimization [M-MATH-102947]

Responsibility: Daniel Hug

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105923	Probability Theory and Combinatorial Optimization (S. 426)	8	Daniel Hug, Günter Last

Conditions
none

M Module: Project Centered Software-Lab [M-MATH-102938]

Responsibility: Gudrun Thäter

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Each summer term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105907	Project Centered Software-Lab (S. 428)	4	Gudrun Thäter

Conditions
none

M Module: Random Graphs [M-MATH-102951]

Responsibility: Matthias Schulte

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105929	Random Graphs (S. 430)	6	Matthias Schulte

Conditions
none

M Module: Rational Homotopy Theory [M-MATH-103256]

Responsibility: Manuel Amann, Roman Sauer

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Once	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-106483	Rational Homotopy Theory (S. 431)	4	Manuel Amann, Roman Sauer

Conditions

none

M Module: Ruin theory [M-MATH-104055]

Responsibility: Vicky Fasen-Hartmann

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108400	Ruin theory (S. 433)	4	Vicky Fasen-Hartmann

Conditions
None

M Module: Scattering Theory [M-MATH-102884]

Responsibility: Frank Hettlich

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Elective Field

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105855	Scattering Theory (S. 434)	8	Tilo Arens, Frank Hettlich, Andreas Kirsch

M Module: Seminar [M-MATH-102730]

Responsibility: Stefan Kühnlein

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory

Contained in: Mathematical Seminar

ECTS	Recurrence	Duration	Language	Version
3	Each term	1 term	German	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105686	Seminar Mathematics (S. 466)	3	

M Module: Sobolev Spaces [M-MATH-102926]

Responsibility: Andreas Kirsch

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105896	Sobolev Spaces (S. 471)	5	Andreas Kirsch

M Module: Spatial Stochastics [M-MATH-102903]

Responsibility: Günter Last

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each winter term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105867	Spatial Stochastics (S. 477)	8	Daniel Hug, Günter Last

Conditions
none

Qualification Objectives
The students are familiar with some basic spatial stochastic processes. They do not only understand how to deal with general properties of distributions, but also know how to describe and apply specific models (Poisson process, Gaussian random fields). They know how to work self-organised and self-reflexive.

Content

- Point processes
- Random measures
- Poisson processes
- Gibbs point processes
- Ralm distributions
- Spatial ergodic theorem
- Spectral Theory of random fields
- Gaussian fields

Recommendations
It is recommended to attend the following modules previously: Probability Theory

M Module: Special Functions and Applications in Potential Theory [M-MATH-101335]

Responsibility: Andreas Kirsch

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-102274	Special Functions and Applications in Potential Theory (S. 478)	5	Andreas Kirsch

Conditions
None

M Module: Special Topics in Harmonic Analysis [M-MATH-104435]

Responsibility: Dirk Hundertmark

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
3	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-109065	Special Topics in Harmonic Analysis (S. 479)	3	Dirk Hundertmark

Conditions
None

Qualification Objectives
The students are familiar with the concepts of singular integral operators and weighted estimates in Harmonic Analysis. They know the relations between the BMO space and the Muckenhoupt weights and also how to use dyadic analysis operators to obtain estimates for Calderon-Zygmund operators.

Content
- Calderon-Zygmund and Singular Integral operators
- BMO space and Muckenhoupt weights
- Reverse Holder Inequality and Factorisation of Ap weights
- Extrapolation Theory and weighted norm inequalities for singular integral operators

M Module: Special Topics of Numerical Linear Algebra [M-MATH-102920]

Responsibility: Marlis Hochbruck

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105891	Special Topics of Numerical Linear Algebra (S. 482)	8	Marlis Hochbruck

Conditions
none

M Module: Spectral Theory [M-MATH-101768]

Responsibility: Lutz Weis

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
8	Each summer term	1 term	German	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-103414	Spectral Theory - Exam (S. 485)	8	Gerd Herzog, Peer Kunstmann, Christoph Schmoeger, Roland Schnaubelt, Lutz Weis

Recommendations

It is recommended to attend the module 'Functional Analysis' previously.

M Module: Spin Manifolds, Alpha Invariant and Positive Scalar Curvature [M-MATH-102958]

Responsibility: Wilderich Tuschmann

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
5	Irregular	1 term	German	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105932	Spin Manifolds, Alpha Invariant and Positive Scalar Curvature (S. 209)	5	Stephan Klaus, Wilderich Tuschmann

M Module: Stein's Method [M-MATH-102946]

Responsibility: Matthias Schulte

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
5	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105914	Stein's Method (S. 487)	5	Matthias Schulte

Conditions
none

M Module: Stochastic Control [M-MATH-102908]

Responsibility: Nicole Bäuerle

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105871	Stochastic Control (S. 490)	4	Nicole Bäuerle

Conditions
none

M Module: Stochastic Differential Equations [M-MATH-102881]

Responsibility: Lutz Weis

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105852	Stochastic Differential Equations (S. 491)	8	Roland Schnaubelt, Lutz Weis

Content

- Brownian motion
- Martingales and Martingal inequalities
- Stochastic integrals and Ito's formula
- Existence and uniqueness of solutions for systems of stochastic differential equations
- Perturbation and stability results
- Application to equations in financial mathematics, physics and engineering
- Connection with diffusion equations and potential theory

M Module: Stochastic Evolution Equations [M-MATH-102942]

Responsibility: Lutz Weis

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105910	Stochastic Evolution Equations (S. 492)	8	Lutz Weis

Conditions
none

M Module: Stochastic Geometry [M-MATH-102865]

Responsibility: Daniel Hug

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in:
Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Each summer term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105840	Stochastic Geometry (S. 493)	8	Daniel Hug, Günter Last

Qualification Objectives

The students

- know the fundamental geometric models and characteristics in stochastic geometry,
- are familiar with properties of Poisson processes of geometric objects,
- know examples of applications of models of stochastic geometry,
- know how to work self-organised and self-reflexive.

Content

- Random Sets
- Geometric Point Processes
- Stationarity and Isotropy
- Germ Grain Models
- Boolean Models
- Foundations of Integral Geometry
- Geometric densities and characteristics
- Random Tessellations

Recommendations

It is recommended to attend the module 'Spatial Stochastics' previously.

Module: Time Series Analysis [M-MATH-102911]

Responsibility: Bernhard Klar

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Stochastics
Mathematical Methods / Elective Field Mathematical Methods / Stochastics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Each summer term	1 term	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105874	Time Series Analysis (S. 504)	4	Norbert Henze, Bernhard Klar

Conditions
None

M Module: Topics in number theory: class field theory and zeta-functions [M-MATH-103543]

Responsibility: Claus-Günther Schmidt

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Elective Field Mathematical Methods / Algebra and Geometry
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Once	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-107069	Topics in number theory: class field theory and zeta-functions (S. 506)	8	Claus-Günther Schmidt

Conditions
None

M Module: Traveling Waves [M-MATH-102927]

Responsibility: Jens Rottmann-Matthes

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Analysis
Mathematical Methods / Elective Field Mathematical Methods / Analysis
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
6	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105897	Traveling Waves (S. 507)	6	Jens Rottmann-Matthes

M Module: Uncertainty Quantification [M-MATH-104054]

Responsibility: Martin Frank

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
4	Each summer term	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-108399	Uncertainty Quantification (S. 508)	4	Martin Frank

Conditions
None

Qualification Objectives
After successfully taking part in the module's classes and exams, students have gained knowledge and abilities as described in the "Inhalt" section.
Specifically, students know several parametrization methods for uncertainties. Furthermore, students are able to describe the basics of several solution methods (stochastic collocation, stochastic Galerkin, Monte-Carlo). Students can explain the so-called curse of dimensionality.
Students are able to apply numerical methods to solve engineering problems formulated as algebraic or differential equations with uncertainties. They can name the advantages and disadvantages of each method. Students can judge whether specific methods are applicable to the specific problem and discuss their results with specialists and colleagues. Finally, students are able to implement the above methods in computer codes.

Content
In this class, we learn to propagate uncertain input parameters through differential equation models, a field called Uncertainty Quantification (UQ). Given uncertain input (parameter values, initial or boundary conditions), how uncertain is the output? The first part of the course ("how to do it") gives an overview on techniques that are used. Among these are:

- Sensitivity analysis
- Monte-Carlo methods
- Spectral expansions
- Stochastic Galerkin method
- Collocation methods, sparse grids

The second part of the course ("why to do it like this") deals with the theoretical foundations of these methods. The so-called "curse of dimensionality" leads us to questions from approximation theory. We look back at the very standard numerical algorithms of interpolation and quadrature, and ask how they perform in many dimensions.

Recommendations
Numerical methods for differential equations

Module: Wavelets [M-MATH-102895]

Responsibility: Andreas Rieder

Organisation: KIT-Fakultät für Mathematik

Curricular Anchorage: Compulsory Elective

Contained in: Mathematical Methods / Analysis or Applied and Numerical Mathematics, Optimization / Applied and Numerical Mathematics, Optimization
Mathematical Methods / Elective Field Mathematical Methods / Applied and Numerical Mathematics, Optimization
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
8	Irregular	1 term	1

Compulsory

Identifier	Course	ECTS	Responsibility
T-MATH-105838	Wavelets (S. 510)	8	Andreas Rieder

Conditions
none

M Module: Advanced Topics in Strategy and Management [M-WIWI-103119]

Responsibility: Hagen Lindstädt

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Irregular	2 terms	German	1

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-106188	Workshop Current Topics in Strategy and Management (S. 515)	3	Hagen Lindstädt
T-WIWI-106189	Workshop Business Wargaming – Analyzing Strategic Interactions (S. 514)	3	Hagen Lindstädt
T-WIWI-106190	Strategy and Management Theory: Developments and "Classics" (S. 496)	3	Hagen Lindstädt

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students

- are able to analyze business strategies and derive recommendations using appropriate frameworks
- learn to express their position through compelling reasoning in structured discussions
- are qualified to critically examine recent research topics in the field of strategic management
- can derive own conclusions from less structured information by using interdisciplinary knowledge

Content
The module is divided into three main topics:
The students

- analyze and discuss a wide range of business strategies on the basis of collectively selected case studies.
- participate in a business wargaming workshop and analyze strategic interactions.
- write a paper about current topics in the field of strategic management theory.

Recommendations
None

Remarks
This course is admission restricted. After being admitted to one course of this module, the participation at the other courses will be guaranteed.
Every course of this module will be at least offered every second term. Thus, it will be possible to complete the module within two terms.
This module will be offered for the first time in the winter term 2017/18.

M Module: Analytics and Statistics [M-WIWI-101637]

Responsibility: Oliver Grothe

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	2 terms	German	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-WIWI-103123	Advanced Statistics (S. 220)	4,5	Oliver Grothe

Ergänzungsangebot
Non-Compulsory Block; You must choose between 4,5 and 5 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-106341	Machine Learning 2 – Advanced Methods (S. 362)	5	Johann Marius Zöllner
T-WIWI-103124	Multivariate Statistical Methods (S. 383)	4,5	Oliver Grothe

Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
The course "*Advanced Statistics*" is compulsory.

Qualification Objectives
A Student

- Deepens the knowledge of descriptive and inferential statistics.
- Deals with simulation methods.
- Learns basic and advanced methods of statistical analysis of multivariate and high-dimensional data.

Content

- Deriving estimates and testing hypotheses
- Stochastic processes
- Multivariate statistics, copulas
- Dependence measures
- Dimension reduction
- High-dimensional methods
- Prediction

Remarks
The planned lectures and courses for the next three years are announced online.

Workload

The total workload for this module is approximately 270 hours.

Module: Applications of Operations Research [M-WIWI-101413]

Responsibility: Stefan Nickel

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Operations Management - Data Analysis - Informatics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	8

Wahlpflichtangebot
Non-Compulsory Block; You must choose between 1 und 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-102704	Facility Location and Strategic Supply Chain Management (S. 304)	4,5	Stefan Nickel
T-WIWI-102714	Tactical and Operational Supply Chain Management (S. 500)	4,5	Stefan Nickel

Ergänzungsangebot
Non-Compulsory Block; You must choose at most 1 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-102726	Global Optimization I (S. 323)	4,5	Oliver Stein
T-WIWI-106199	Modeling and OR-Software: Introduction (S. 381)	4,5	Stefan Nickel
T-WIWI-106545	Optimization under uncertainty (S. 412)	5	Steffen Rebennack

Learning Control / Examinations
The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.
The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
At least one of the courses *Facility Location and strategic Supply Chain Management* and *Tactical and operational Supply Chain Management* has to be taken.

Qualification Objectives
The student

- is familiar with basic concepts and terms of Supply Chain Management,
- knows the different areas of Supply Chain Management and their respective optimization problems,
- is acquainted with classical location problem models (in the plane, on networks and discrete) as well as fundamental methods for distribution and transport planning, inventory planning and management,
- is able to model practical problems mathematically and estimate their complexity as well as choose and adapt appropriate solution methods.

Content
Supply Chain Management is concerned with the planning and optimization of the entire, inter-company procurement, production and distribution process for several products taking place between different business partners (suppliers, logistics

service providers, dealers). The main goal is to minimize the overall costs while taking into account several constraints including the satisfaction of customer demands.
This module considers several areas of Supply Chain Management. On the one hand, the determination of optimal locations within a supply chain is addressed. Strategic decisions concerning the location of facilities like production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning tasks allow an efficient flow of materials and lead to lower costs and increased customer service. On the other hand, the planning of material transport in the context of Supply Chain Management represents another focus of this module. By linking transport connections and different facilities, the material source (production plant) is connected with the material sink (customer). For given material flows or shipments, it is considered how to choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints.
Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in Suppy Chain Management, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

Recommendations
The courses Introduction to Operations Research I and II are helpful.

Remarks
The planned lectures and courses for the next three years are announced online.

Workload
The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.

M Module: Collective Decision Making [M-WIWI-101504]

Responsibility: Clemens Puppe

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	2

Compulsory

Identifier	Course	ECTS	Responsibility
T-WIWI-102740	Public Management (S. 429)	4,5	Berthold Wigger
T-WIWI-102859	Social Choice Theory (S. 472)	4,5	Clemens Puppe

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The overall grade of the the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

None

Qualification Objectives

Students

- are able to model practical problems of the public sector and to analyze them with respect to positive and normative questions,
- understand individual incentives and social outcomes of different institutional designs,
- are familiar with the functioning and design of democratic elections and can analyze them with respect to their individual incentives.

Content

The focus of the module is on mechanisms of public decisions making, including voting and the aggregation of preferences and judgements.

Workload

The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Decision and Game Theory [M-WIWI-102970]

Responsibility: Clemens Puppe

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Language	Version
9	German	1

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-102613	Auction Theory (S. 232)	4,5	Karl-Martin Ehrhart
T-WIWI-102614	Experimental Economics (S. 300)	4,5	Jella Pfeiffer, Christof Weinhardt
T-WIWI-102861	Advanced Game Theory (S. 212)	4,5	Karl-Martin Ehrhart, Clemens Puppe, Johannes Philipp Reiß

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

None

Qualification Objectives

The student learns the basics of individual and strategic decisions on an advanced and formal level.
He learns to analyze economic problems through abstract and method-based thinking and to design solution strategies. In the tutorials, the concepts and results of the lecture will be applied in case studies.

Content

See German version.

Workload

The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Disruptive FinTech Innovations [M-WIWI-103261]

Responsibility:	Maxim Ulrich
Organisation:	KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage:	Compulsory Elective
Contained in:	Finance - Risk Management - Managerial Economics Elective Field

ECTS	Recurrence	Duration	Language	Version
9	Each summer term	1 term	English	1

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-106193	Engineering FinTech Solutions (S. 296)	4,5	Maxim Ulrich
T-WIWI-106496	Computational FinTech with Python and C++ (S. 257)	1,5	
T-WIWI-106495	Automated Financial Advisory (S. 233)	3	Maxim Ulrich

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None.

Qualification Objectives
Students with a strong technological background and/or a strong interest for software development and investments will learn how to build a prototype that automates essential steps for a fully automated investment and risk management process. Students also learn to organize themselves efficiently in teams of several developers in order to complete a prototype in a limited amount of time. Moreover, students deepen their understanding of finance and technology and learn how to combine both in an effective way. Students will hence be well prepared to become leaders and pioneers for upcoming FinTech innovations (and beyond) to help society to better invest for the future and to better protect from adverse risks.

Content
See respective lecture

Recommendations
None

Remarks
See respective lecture

Workload
The total workload for this module is approximately 270 hours. For further information, see respective lecture.

M Module: Econometrics and Statistics I [M-WIWI-101638]

Responsibility: Melanie Schienle

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	1 term	German	3

Compulsory

Identifier	Course	ECTS	Responsibility
T-WIWI-103125	Applied Econometrics (S. 228)	4,5	Melanie Schienle

Ergänzungsangebot
Non-Compulsory Block; You must choose between 4,5 and 5 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-103066	Data Mining and Applications (S. 271)	4,5	Rheza Nakhaeizadeh
T-WIWI-103064	Financial Econometrics (S. 307)	4,5	Melanie Schienle
T-WIWI-103126	Non- and Semiparametrics (S. 385)	4,5	Melanie Schienle
T-WIWI-103127	Panel Data (S. 414)	4,5	Wolf-Dieter Heller
T-WIWI-103065	Statistical Modeling of generalized regression models (S. 486)	4,5	Wolf-Dieter Heller

Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
The course "*Advanced Statistics*" [2520020] is compulsory and must be examined.
The course Financial Econometrics [2520022] can only be passed if the course Time Series Analysis in the module Time Series Analysis and the course Generalized Regression Models in the module Generalized Regression Models have not be passed.

Qualification Objectives
The student shows an in depth understanding of advanced Econometric techniques suitable for different types of data.He/She is able to apply his/her theoretical knowledge to real world problems with the help of statistical software and to evaluate performance of different approaches based on statistical criteria.

Content
The courses of this module offer students a broad range of advanced Econometric techniques for state-of-the art data analysis.

Workload
The total workload for this module is approximately 270 hours.

M Module: Econometrics and Statistics II [M-WIWI-101639]

Responsibility: Melanie Schienle

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	1 term	German	2

Wahlplfichtangebot
Non-Compulsory Block; You must choose between 9 and 10 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-103066	Data Mining and Applications (S. 271)	4,5	Rheza Nakhaeizadeh
T-WIWI-103064	Financial Econometrics (S. 307)	4,5	Melanie Schienle
T-WIWI-103124	Multivariate Statistical Methods (S. 383)	4,5	Oliver Grothe
T-WIWI-103126	Non- and Semiparametrics (S. 385)	4,5	Melanie Schienle
T-WIWI-103127	Panel Data (S. 414)	4,5	Wolf-Dieter Heller
T-WIWI-103128	Portfolio and Asset Liability Management (S. 419)	4,5	Mher Safarian
T-WIWI-103065	Statistical Modeling of generalized regression models (S. 486)	4,5	Wolf-Dieter Heller
T-WIWI-103129	Stochastic Calculus and Finance (S. 488)	4,5	Mher Safarian

Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
This module can only be passed if the module *"Econometrics and Statistics I"* has been finished successfully before.
The course Financial Econometrics [2520022] can only be passed if the course Time Series Analysis in the module Time Series Analysis and the course Generalized Regression Models in the module Generalized Regression Models have not be passed.

Modeled Conditions
The following conditions must be met:

- The module [M-WIWI-101638] *Econometrics and Statistics I* must have been started.

Qualification Objectives
The student shows an in depth understanding of advanced Econometric techniques suitable for different types of data. He/She is able to apply his/her theoretical knowledge to real world problems with the help of statistical software and to evaluate performance of different approaches based on statistical criteria.

Content
This modula builds on prerequisites acquired in Module *"Econometrics and Statistics I"*. The courses of this module offer students a broad range of advanced Econometric techniques for state-of-the art data analysis.

Workload
The total workload for this module is approximately 270 hours.

M Module: Economic Theory and its Application in Finance [M-WIWI-101502]

Responsibility: Kay Mitusch

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	1 term	German	3

Ergänzungsangebot
Non-Compulsory Block; You must choose one course.

Identifier	Course	ECTS	Responsibility
T-WIWI-102622	Corporate Financial Policy (S. 265)	4,5	Martin Ruckes
T-WIWI-102623	Financial Intermediation (S. 308)	4,5	Martin Ruckes
T-WIWI-102647	Asset Pricing (S. 230)	4,5	Martin Ruckes, Marliese Uhrig-Homburg

Wahlpflichtangebot
Non-Compulsory Block; You must choose one course.

Identifier	Course	ECTS	Responsibility
T-WIWI-102609	Advanced Topics in Economic Theory (S. 222)	4,5	Kay Mitusch
T-WIWI-102861	Advanced Game Theory (S. 212)	4,5	Karl-Martin Ehrhart, Clemens Puppe, Johannes Philipp Reiß

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately. The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

One of the courses T-WIWI-102861 "Advanced Game Theory" and T-WIWI-102609 "Advanced Topics in Economic Theory" is compulsary.

Qualification Objectives

The students

- have learnt the methods of formal economic modeling, particularly of General Equilibrium Theory and contract theory
- will be able to apply these methods to the topics in Finance, specifically the areas of financial markets and institutions and corporate finance
- have gained many useful insights into the relationship between firms and investors and the functioning of financial markets

Content

The mandatory course "Advanced Topics in Economic Theory" is devoted in equal parts to General Equilibrium Theory and to contract theory. The course “Asset Pricing” will apply techniques of General Equilibrium Theory to valuation of financial assets. The courses “Corporate Financial Policy” and “Finanzintermediation” will apply the techniques of contract theory to issues of corporate finance and financial institutions.

Workload

The total workload for this module is approximately 270 hours. For further information see German version.

M Module: eEnergy: Markets, Services and Systems [M-WIWI-103720]

Responsibility: Christof Weinhardt

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field

ECTS	Recurrence	Duration	Language	Version
9	Each term	1 term	German	1

Wahlpflichtangebot
Non-Compulsory Block; You must choose at least 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-107501	Energy Market Engineering (S. 291)	4,5	Christof Weinhardt
T-WIWI-107503	Energy Networks and Regulation (S. 293)	4,5	Christof Weinhardt
T-WIWI-107504	Smart Grid Applications (S. 470)	4,5	Johannes Gärttner, Christof Weinhardt

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None.

Qualification Objectives
The student

- is aware of design options for energy and especially electricity markets and can derive implications for the market results from the market design,
- knows about current trends regarding the Smart Grid and understands affiliated modelling aproaches,
- can evaluate business models of electricity grids according to the regulation regime
- is prepared for scientific contributions in the field of energy system analysis.

Content
The module conveys scientific and practical knowledge to analyse energy markets and according business models. To do so the scientific discussion on energy market designs is evaluated and analysed. Different energy market models are presented and their design implications are evaluated. Furthermore, the electricity system is analysed with regards to being a network industry and resulting regulation and business models are discussed. Besides these traditional areas of energy economics we will look at methods and models of digitalisation in the energy sector.

Remarks
The lecture Smart Grid Applications will be available starting in the winter term 2018/19.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Energy Economics and Technology [M-WIWI-101452]

Responsibility: Wolf Fichtner

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Operations Management - Data Analysis - Informatics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	3

Wahlpflichtangebot
Non-Compulsory Block; You must choose at least 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-102793	Efficient Energy Systems and Electric Mobility (S. 286)	3,5	Patrick Jochem, Russell McKenna
T-WIWI-102650	Energy and Environment (S. 290)	4,5	Ute Karl
T-WIWI-102830	Energy Systems Analysis (S. 295)	3	Valentin Bertsch
T-WIWI-107464	Smart Energy Infrastructure (S. 469)	3	Armin Ardone, Andrej Marko Pustisek
T-WIWI-102694	Technological Change in Energy Economics (S. 501)	3	Martin Wietschel
T-WIWI-102695	Heat Economy (S. 333)	3	Wolf Fichtner

Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations take place every semester. Re-examinations are offered at every ordinary examination date.The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
To integrate the module "Energy Economics and Technology" in the degree programme "Wirtschaftsmathematik" it is compulsory to choose the course „Energy Systems Analysis“.

Qualification Objectives
The student

- gains detailed knowledge about present and future energy supply technologies (focus on final energy carriers electricity and heat),
- knows the techno-economic characteristics of plants for energy provision, for energy transport as well as for energy distribution and demand,
- is able to assess the environmental impact of these technologies.

Content
Strategical Aspects of Energy Economy: Long-term planning methods, generation technologies
Technological Change in Energy Economics: Future energy technologies, learning curves, energy demand
Heat Economy: district heating, heating technologies, reduction of heat demand, statutory provisions
Energy Systems Analysis: Interdependencies in energy economics, energy systems modelling approaches in energy economics
Energy and Environment: emission factors, emission reduction measures, environmental impact

Efficient Energy Systems and Electric Mobility: concepts and current trends in energy efficiency, Overview of and economical, ecological and social impacts through electric mobility

Workload

The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Experimental Economics [M-WIWI-101505]

Responsibility: Johannes Philipp Reiß

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	2 terms	German	5

Wahlpflichtangebot
Non-Compulsory Block; You must choose 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-102862	Predictive Mechanism and Market Design (S. 423)	4,5	Johannes Philipp Reiß
T-WIWI-102863	Topics in Experimental Economics (S. 505)	4,5	Johannes Philipp Reiß
T-WIWI-105781	Incentives in Organizations (S. 337)	4,5	Petra Nieken
T-WIWI-102614	Experimental Economics (S. 300)	4,5	Jella Pfeiffer, Christof Weinhardt

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None.

Qualification Objectives
Students

- are acquainted with the methods of Experimental Economics along with its strengths and weaknesses;
- understand how theory-guided research in Experimental Economics interacts with the development of theory;
- are provided with foundations in data analysis;
- design an economic experiment and analyze its outcome.

Content
The module Experimental Economics offers an introduction into the methods and topics of Experimental Economics. It also fosters and extends knowledge in theory-guided experimental economics and its interaction with theory development. Throughout the module, readings of selected papers are required.

Recommendations
Basic knowledge in mathematics, statistics, and game theory is assumed.

Remarks
The course "Predictive Mechanism and Market Design" is offered every second winter semester, e.g. WS2013 / 14, WS2015 / 16, ...

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Finance 1 [M-WIWI-101482]

Responsibility: Martin Ruckes, Marliese Uhrig-Homburg

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	1

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-102643	Derivatives (S. 275)	4,5	Marliese Uhrig-Homburg
T-WIWI-102621	Valuation (S. 509)	4,5	Martin Ruckes
T-WIWI-102647	Asset Pricing (S. 230)	4,5	Martin Ruckes, Marliese Uhrig-Homburg

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
The student

- has core skills in economics and methodology in the field of finance
- assesses corporate investment projects from a financial perspective
- is able to make appropriate investment decisions on financial markets

Content
The courses of this module equip the students with core skills in economics and methodology in the field of modern finance. Securities which are traded on financial and derivative markets are presented, and frequently applied trading strategies are discussed. A further focus of this module is on the assessment of both profits and risks in security portfolios and corporate investment projects from a financial perspective.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Finance 2 [M-WIWI-101483]

Responsibility: Martin Ruckes, Marliese Uhrig-Homburg

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	3

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-102647	Asset Pricing (S. 230)	4,5	Martin Ruckes, Marliese Uhrig-Homburg
T-WIWI-108880	Blockchains & Cryptofinance (S. 235)	4,5	Philipp Schuster, Marliese Uhrig-Homburg
T-WIWI-102625	Exchanges (S. 299)	1,5	Jörg Franke
T-WIWI-102622	Corporate Financial Policy (S. 265)	4,5	Martin Ruckes
T-WIWI-109050	Corporate Risk Management (S. 266)	3	Martin Ruckes
T-WIWI-102643	Derivatives (S. 275)	4,5	Marliese Uhrig-Homburg
T-WIWI-102600	eFinance: Information Engineering and Management for Securities Trading (S. 287)	4,5	Christof Weinhardt
T-WIWI-102644	Fixed Income Securities (S. 311)	4,5	Marliese Uhrig-Homburg
T-WIWI-102900	Financial Analysis (S. 306)	4,5	Torsten Luedecke
T-WIWI-102623	Financial Intermediation (S. 308)	4,5	Martin Ruckes
T-WIWI-102626	Business Strategies of Banks (S. 245)	3	Wolfgang Müller
T-WIWI-102646	International Finance (S. 348)	3	Marliese Uhrig-Homburg
T-WIWI-102645	Credit Risk (S. 268)	4,5	Marliese Uhrig-Homburg
T-WIWI-102621	Valuation (S. 509)	4,5	Martin Ruckes

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
It is only possible to choose this module in combination with the module *Finance 1*. The module is passed only after the final partial exam of *Finance 1* is additionally passed.

Modeled Conditions
The following conditions must be met:

- The module [M-WIWI-101482] *Finance 1* must have been started.

Qualification Objectives
The student is in a position to discuss, analyze and provide answers to advanced economic and methodological issues in the field of modern finance.

Content

The module Finance 2 is based on the module Finance 1. The courses of this module equip the students with advanced skills in economics and methodology in the field of modern finance on a broad basis.

Remarks

The courses *eFinance: Information Engineering and Management for Securities Trading* [2540454] and *Financial Analysis* [2530205] can be chosen from summer term 2015 on.

Workload

The total workload for this module is approximately 270 hours. For further information see German version.

Module: Finance 3 [M-WIWI-101480]

Responsibility: Martin Ruckes, Marliese Uhrig-Homburg

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	3

Wahlpflichtangebot
Non-Compulsory Block; You must choose at least 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-102647	Asset Pricing (S. 230)	4,5	Martin Ruckes, Marliese Uhrig-Homburg
T-WIWI-108880	Blockchains & Cryptofinance (S. 235)	4,5	Philipp Schuster, Marliese Uhrig-Homburg
T-WIWI-102625	Exchanges (S. 299)	1,5	Jörg Franke
T-WIWI-102622	Corporate Financial Policy (S. 265)	4,5	Martin Ruckes
T-WIWI-109050	Corporate Risk Management (S. 266)	3	Martin Ruckes
T-WIWI-102643	Derivatives (S. 275)	4,5	Marliese Uhrig-Homburg
T-WIWI-102600	eFinance: Information Engineering and Management for Securities Trading (S. 287)	4,5	Christof Weinhardt
T-WIWI-102644	Fixed Income Securities (S. 311)	4,5	Marliese Uhrig-Homburg
T-WIWI-102900	Financial Analysis (S. 306)	4,5	Torsten Luedecke
T-WIWI-102623	Financial Intermediation (S. 308)	4,5	Martin Ruckes
T-WIWI-102626	Business Strategies of Banks (S. 245)	3	Wolfgang Müller
T-WIWI-102646	International Finance (S. 348)	3	Marliese Uhrig-Homburg
T-WIWI-102645	Credit Risk (S. 268)	4,5	Marliese Uhrig-Homburg
T-WIWI-102621	Valuation (S. 509)	4,5	Martin Ruckes

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
It is only possible to choose this module in combination with the module *Finance 1*and *Finance 2*. The module is passed only after the final partial exams of *Finance 1 and Finance 2* are additionally passed.

Modeled Conditions
The following conditions must be met:

1. The module [M-WIWI-101482] *Finance 1* must have been started.
2. The module [M-WIWI-101483] *Finance 2* must have been started.

Qualification Objectives
The student is in a position to discuss, analyze and provide answers to advanced economic and methodological issues in

the field of modern finance.

Content

The courses of this module equip the students with advanced skills in economics and methodology in the field of modern finance on a broad basis.

Remarks

The courses eFinance: Information Engineering and Management for Securities Trading [2540454] and Financial Analysis [2530205] can be chosen from summer term 2015 on.

Workload

The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Growth and Agglomeration [M-WIWI-101496]

Responsibility: Ingrid Ott

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	3

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-109194	Dynamic Macroeconomics (S. 283)	4,5	Johannes Brumm
T-WIWI-102785	Theory of Endogenous Growth (S. 503)	4,5	Ingrid Ott
T-WIWI-103107	Spatial Economics (S. 476)	4,5	Ingrid Ott

Learning Control / Examinations
The assessment is carried out as partial written exams (see the lectures descriptions).
The overall grade for the module is the average of the grades for each course weighted by the credits.

Conditions
None

Qualification Objectives
The student

- gains deepened knowledge of micro-based general equilibrium models
- understands how based on individual optimizing decisions aggregate phenomena like economic growth or agglomeration (cities / metropolises) result
- is able to understand and evaluate the contribution of these phenomena to the development of economic trends
- can derive policy recommendations based on theory

Content
The module includes the contents of the lectures *Endogenous Growth Theory* [2561503], *Spatial Economics* [2561260] and *International Economic Policy* [2560254]. While the first two lectures have a more formal-analytic focus, the third lecture approaches fundamental ideas and problems from the field of international economic policy from a more verbal perspective.
The common underlying principle of all three lectures in this module is that, based on different theoretical models, economic policy recommendations are derived.

Recommendations
Attendance of the course *Introduction Economic Policy* [2560280] is recommended.
Successful completion of the courses *Economics I: Microeconomics* and *Economics II: Macroeconomics* is required.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Informatics [M-WIWI-101472]

Responsibility: Andreas Oberweis, Harald Sack, York Sure-Vetter, Johann Marius Zöllner

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Operations Management - Data Analysis - Informatics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	7

Wahlpflichtangebot
Non-Compulsory Block; You must choose between 9 and 10 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-102651	Applied Informatics II - IT Systems for eCommerce (S. 229)	5	Ali Sunyaev
T-WIWI-102680	Computational Economics (S. 255)	5	Pradyumn Kumar Shukla
T-WIWI-102661	Database Systems and XML (S. 273)	5	Andreas Oberweis
T-WIWI-102655	Efficient Algorithms (S. 285)	5	Pradyumn Kumar Shukla
T-WIWI-102668	Enterprise Architecture Management (S. 297)	5	Thomas Wolf
T-WIWI-106423	Information Service Engineering (S. 339)	5	Harald Sack
T-WIWI-102666	Knowledge Discovery (S. 357)	5	York Sure-Vetter
T-WIWI-102667	Management of IT-Projects (S. 364)	5	Roland Schätzle
T-WIWI-106340	Machine Learning 1 - Basic Methods (S. 361)	5	Johann Marius Zöllner
T-WIWI-106341	Machine Learning 2 – Advanced Methods (S. 362)	5	Johann Marius Zöllner
T-WIWI-102697	Business Process Modelling (S. 243)	5	Andreas Oberweis
T-WIWI-102679	Nature-Inspired Optimisation Methods (S. 384)	5	Pradyumn Kumar Shukla
T-WIWI-102874	Semantic Web Technologies (S. 436)	5	York Sure-Vetter
T-WIWI-105801	Service Oriented Computing (S. 467)	5	York Sure-Vetter
T-WIWI-102895	Software Quality Management (S. 474)	5	Andreas Oberweis
T-WIWI-102676	Special Topics of Enterprise Information Systems (S. 481)	5	Andreas Oberweis
T-WIWI-102657	Special Topics of Efficient Algorithms (S. 480)	5	Hartmut Schmeck
T-WIWI-102678	Special Topics of Software- and Systemsengineering (S. 483)	5	Andreas Oberweis
T-WIWI-102669	Strategic Management of Information Technology (S. 495)	5	Thomas Wolf
T-WIWI-103112	Web Science (S. 511)	5	York Sure-Vetter
T-WIWI-108751	Special Topics of Web Science (S. 484)	5	York Sure-Vetter
T-WIWI-102662	Workflow-Management (S. 512)	5	Andreas Oberweis
T-WIWI-103523	Advanced Lab Informatics (S. 214)	4	Andreas Oberweis, Harald Sack, Ali Sunyaev, York Sure-Vetter, Melanie Volkamer, Johann Marius Zöllner
T-WIWI-109248	Critical Information Infrastructures (S. 269)	5	Ali Sunyaev
T-WIWI-109246	Digital Health (S. 277)	4	Ali Sunyaev
T-WIWI-109250	Emerging Trends in Criticial Information Infrastructures (S. 289)	4	Ali Sunyaev
T-WIWI-109249	Sociotechnical Information Systems Development (S. 473)	4	Ali Sunyaev
T-WIWI-109251	Selected Issues in Critical Information Infrastructures (S. 435)	4	Ali Sunyaev

T-WIWI-109270	Human Factors in Security and Privacy (S. 335)	5	Melanie Volkamer
T-WIWI-109271	Advanced Lab User Studies in Security (S. 219)	4	Melanie Volkamer
T-WIWI-108439	Advanced Lab Security, Usability and Society (S. 218)	4	Melanie Volkamer

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.
The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.
When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
Please note the following information about the module component exams of Prof. Dr. H. Schmeck:
The examinations in Algorithms for Internet Applications [T-WIWI-102658], Efficient Algorithms [T-WIWI-102655], Organic Computing [T-WIWI-102659] and Smart Energy Distribution [T-WIWI-102845] are offered latest until summer term 2017 (repeaters only).

Conditions
It is only allowed to choose one lab.

Qualification Objectives
The student

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

Content
The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

Remarks
The course T-WIWI-102759 "Requirements Analysis and Requirements Management" will no longer be offered in the module as of winter semester 2018/2019.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Information Systems in Organizations [M-WIWI-104068]

Responsibility: Alexander Mädche

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	2 terms	German	2

Wahlpflichtangebot
Non-Compulsory Block; You must choose at least 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-105777	Business Intelligence Systems (S. 241)	4,5	Alexander Mädche, Mario Nadj, Peyman Toreini
T-WIWI-106201	Digital Transformation of Organizations (S. 278)	4,5	Alexander Mädche
T-WIWI-108461	Interactive Information Systems (S. 347)	4,5	Alexander Mädche, Stefan Morana
T-WIWI-108437	Practical Seminar: Information Systems and Service Design (S. 422)	4,5	Norbert Koppenhagen, Alexander Mädche

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
The student

- has a comprehensive understanding of conceptual and theoretical foundations of informations systems in organizations
- is aware of the most important classes of information systems used in organizations:. process-centric, information-centric and people-centric information systems.
- knows the most important activities required to execute in the pre-implementation, implementation and post-implementation phase of information systems in organizations in order to create business value
- has a deep understanding of key capabilities of business intelligence systems and/or interactive information systems used in organizations

Content
During the last decades we witnessed a growing importance of Information Technology (IT) in the business world along with faster and faster innovation cycles. IT has become core for businesses from an operational company-internal and external customer perspective. Today, companies have to rethink their way of doing business, from an internal as well as an external digitalization perspective.
This module focuses on the internal digitalization perspective. The contents of the module abstract from the technical implementation details and focus on foundational concepts, theories, practices and methods for information systems in

organizations. The students get the necessary knowledge to guide the successful digitalization of organizations. Each lecture in the module is accompanied with a capstone project that is carried out in cooperation with an industry partner.

Remarks
New module starting summer term 2018.

Workload
The total workload for this module is approximately 270 hours.

M Module: Innovation and Growth [M-WIWI-101478]

Responsibility: Ingrid Ott

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	3

Wahlpflichtangebot
Non-Compulsory Block; You must choose between 9 and 10 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-109194	Dynamic Macroeconomics (S. 283)	4,5	Johannes Brumm
T-WIWI-102785	Theory of Endogenous Growth (S. 503)	4,5	Ingrid Ott
T-WIWI-102840	Innovationtheory and -Policy (S. 341)	4,5	Ingrid Ott

Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offerd at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students shall be given the ability to

- know the basic techniques for analyzing static and dynamic optimization models that are applied in the context of micro-and macroeconomic theories
- understand the important role of innovation to the overall economic growth and welfare
- identify the importance of alternative incentive mechanisms for the emergence and dissemination of innovations
- explain, in which situations market interventions by the state, for example taxes and subsidies, can be legitimized, and evaluate them in the light of economic welfare

Content
The module includes courses that deal with issues of innovation and growth in the context of micro-and macroeconomic theories. The dynamic analysis makes it possible to analyze the consequences of individual decisions over time, and sheds light on the tension between static and dynamic efficiency in particular. In this context is also analyzed, which policy is appropriate to carry out corrective interventions in the market and thus increase welfare in the presence of market failure.

Recommendations
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

Workload
Total expenditure of time for 9 credits: 270 hours

Attendance time per lecture: 3x14h

Preparation and wrap-up time per lecture: 3x14h

Rest: Exam Preparation

The exact distribution is subject to the credits of the courses of the module.

M Module: Insurance Management I [M-WIWI-101469]

Responsibility: Ute Werner

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	3

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-102603	Principles of Insurance Management (S. 425)	4,5	Ute Werner
T-WIWI-102601	Insurance Marketing (S. 343)	4,5	Edmund Schwake
T-WIWI-102648	Insurance Production (S. 344)	4,5	Ute Werner
T-WIWI-102637	Current Issues in the Insurance Industry (S. 270)	2	Wolf-Rüdiger Heilmann
T-WIWI-102636	Insurance Risk Management (S. 345)	2,5	Harald Maser
T-WIWI-102797	P&C Insurance Simulation Game (S. 413)	3	Ute Werner
T-WIWI-102649	Risk Communication (S. 432)	4,5	Ute Werner
T-WIWI-102841	Modelling, Measuring and Managing of Extreme Risks (S. 382)	2,5	Ute Werner

Learning Control / Examinations
From 01.10.2017 (winter term 2017/2018) the module is no longer available.
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
See German version.

Content
See German version.

Remarks
Please note:

- T-WIWI-102636Insurance Risk Managementwill be offered as a seminar startingsummer term2017.
- T-WIWI-102797 P+C Insurance Simulation Game will not be offered anymore from winter term 2016/2017 on;
- T-WIWI-102603Principles of Insurance Managementwill be offered latest until summer term 2017 (beginners only);
- T-WIWI-102648Insurance Productionwill be offered latest until summer term 2017 (beginners only);
- T-WIWI-102636Insurance Risk Managementwill be offered latest until summer term 2017 (beginners only);
- T-WIWI-102649Risk Communication will be offered latest until winterterm 2017/2018 (beginners only);
- T-WIWI-102841Modelling, Measuring and Managing of Extreme Riskswill be offered latest until summer term 2017 (beginners only).

Workload
See German version.

Module: Intelligent Risk and Investment Advisory [M-WIWI-103247]

Responsibility: Maxim Ulrich

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	1 term	English	3

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-106442	Building Intelligent and Robo-Adviced Portfolios (S. 240)	9	Maxim Ulrich
T-WIWI-107032	Computational Risk and Asset Management I (S. 258)	4,5	Maxim Ulrich
T-WIWI-106494	Computational Risk and Asset Management II (S. 259)	4,5	Maxim Ulrich
T-WIWI-106193	Engineering FinTech Solutions (S. 296)	4,5	Maxim Ulrich

Learning Control / Examinations
In winter semester 2018/2019 no exam for the courses “Building Intelligent and Robo-Adviced Portfolios” and “Computational Risk and Asset Management I / II” will be offered.
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None.

Qualification Objectives
Students obtain a practical and yet research oriented introduction into the field of quantitative and computational risk and investment management. Students learn how to use concepts from computer science, statistics, OR and economics to build intelligent risk and investment systems. Based on personal preferences, students can specialize within the module on either more practical programming and statistical learning points or more on the economic and mathematical insights and intuition.
After successful completion of the module, students know the industry intuition as well as state-of-the-art academic ‘financial engineering’ methods necessary to successfully contribute to sustainable and value oriented innovations in the field of intelligent risk and investment advisory.

Content
See respective lecture

Recommendations
None

Remarks
See respective lecture

Workload
The total workload for this module is approximately 270 hours. For further information, see respective lecture.

M Module: Marketing Management [M-WIWI-101490]

Responsibility: Martin Klarmann

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Operations Management - Data Analysis - Informatics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each summer term	1 term	9

Wahlpflichtangebot
Non-Compulsory Block; You must choose at least 1 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-107720	Market Research (S. 366)	4,5	
T-WIWI-102883	Pricing (S. 424)	4,5	Sven Feurer
T-WIWI-102812	Product and Innovation Management (S. 427)	3	Martin Klarmann

Ergänzungsangebot
Non-Compulsory Block; You must choose at most 1 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-106137	Country Manager Simulation (S. 267)	1,5	Sven Feurer
T-WIWI-102835	Marketing Strategy Business Game (S. 367)	1,5	Martin Klarmann
T-WIWI-102842	Strategic Brand Management (S. 494)	1,5	Joachim Blickhäuser, Martin Klarmann

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.
When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
The course "Market Research" is obligatory.

Qualification Objectives
Students
- have an advanced knowledge about central marketing contents
- have a fundamental understanding of the marketing instruments
- know and understand several strategic concepts and how to implement them
- are able to implement their extensive marketing knowledge in a practical context
- know several qualitative and quantitative approaches to prepare decisions in Marketing
- have the theoretical knowledge to write a master thesis in Marketing
- have the theoretical knowledge to work in/together with the Marketing department

Content
The aim of this module is to deepen central marketing contents in different areas. Therefore the students can choose between the following marketing courses:

- Product and Innovation Marketing

- Market Research – this course has to be completed successfully by students interested in seminar or master thesis positions at the chair of marketing
- Marketing Strategy Business Game
- Strategic Brand Management

Remarks

Please note that only one of the listed 1,5-ECTS courses can be chosen in the Marketing Management module.

Workload

The total workload for this module is approximately 270 hours.

M Module: Mathematical Programming [M-WIWI-101473]

Responsibility: Oliver Stein

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Operations Management - Data Analysis - Informatics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	4

Wahlpflichtangebot
Non-Compulsory Block; You must choose at most 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-102719	Mixed Integer Programming I (S. 377)	4,5	Oliver Stein
T-WIWI-102726	Global Optimization I (S. 323)	4,5	Oliver Stein
T-WIWI-103638	Global optimization I and II (S. 325)	9	Oliver Stein
T-WIWI-102856	Convex Analysis (S. 263)	4,5	Oliver Stein
T-WIWI-102724	Nonlinear Optimization I (S. 388)	4,5	Oliver Stein
T-WIWI-103637	Nonlinear Optimization I and II (S. 390)	9	Oliver Stein
T-WIWI-102855	Parametric Optimization (S. 416)	4,5	Oliver Stein

Ergänzungsangebot
Non-Compulsory Block; You must choose at most 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-106548	Advanced Stochastic Optimization (S. 221)	4,5	Steffen Rebennack
T-WIWI-102720	Mixed Integer Programming II (S. 378)	4,5	Oliver Stein
T-WIWI-102727	Global Optimization II (S. 327)	4,5	Oliver Stein
T-WIWI-102723	Graph Theory and Advanced Location Models (S. 330)	4,5	Stefan Nickel
T-WIWI-106549	Large-scale Optimization (S. 359)	4,5	Steffen Rebennack
T-WIWI-102725	Nonlinear Optimization II (S. 392)	4,5	Oliver Stein
T-WIWI-102715	Operations Research in Supply Chain Management (S. 409)	4,5	Stefan Nickel

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
At least one of the courses “Mixed Integer Programming I”, “Parametric Optimization”, “Convex Analysis”, “Nonlinear Optimization I” and “Global Optimization I” has to be taken.

Qualification Objectives
The student

- names and describes basic notions for advanced optimization methods, in particular from continuous and mixed

integer programming,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions,
- identifies drawbacks of the solution methods and, if necessary, is able to makes suggestions to adapt them to practical problems.

Content
The modul focuses on theoretical foundations as well as solution algorithms for optimization problems with continuous and mixed integer decision variables.

Remarks
The lectures are partly offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu). For the lectures of Prof. Stein a grade of 30 % of the exercise course has to be fulfilled. The description of the particular lectures is more detailed.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Methodical Foundations of OR [M-WIWI-101414]

Responsibility: Oliver Stein

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Operations Management - Data Analysis - Informatics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	8

Wahlpflichtangebot
Non-Compulsory Block; You must choose at least 1 courses and between 4,5 and 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-102726	Global Optimization I (S. 323)	4,5	Oliver Stein
T-WIWI-103638	Global optimization I and II (S. 325)	9	Oliver Stein
T-WIWI-102724	Nonlinear Optimization I (S. 388)	4,5	Oliver Stein
T-WIWI-103637	Nonlinear Optimization I and II (S. 390)	9	Oliver Stein

Ergänzungsangebot
Non-Compulsory Block;

Identifier	Course	ECTS	Responsibility
T-WIWI-106546	Introduction to Stochastic Optimization (S. 354)	4,5	Steffen Rebennack
T-WIWI-102727	Global Optimization II (S. 327)	4,5	Oliver Stein
T-WIWI-102725	Nonlinear Optimization II (S. 392)	4,5	Oliver Stein
T-WIWI-102704	Facility Location and Strategic Supply Chain Management (S. 304)	4,5	Stefan Nickel

Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
At least one of the courses *Nonlinear Optimization I* and *Global Optimization I* has to be examined.

Qualification Objectives
The student

- names and describes basic notions for optimization methods, in particular from nonlinear and from global optimization,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions.

Content
The modul focuses on theoretical foundations as well as solution algorithms for optimization problems with continuous

decision variables. The lectures on nonlinear programming deal with local solution concepts, whereas the lectures on global optimization treat approaches for global solutions.

Recommendations
The courses Introduction to Operations Research I and II are helpful.

Remarks
The planned lectures and courses for the next three years are announced online (http://www.ior.kit.edu).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Microeconomic Theory [M-WIWI-101500]

Responsibility: Clemens Puppe

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Finance - Risk Management - Managerial Economics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	2 terms	German	2

Wahlpflichtangebot
Non-Compulsory Block; You must choose 9 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-102609	Advanced Topics in Economic Theory (S. 222)	4,5	Kay Mitusch
T-WIWI-102861	Advanced Game Theory (S. 212)	4,5	Karl-Martin Ehrhart, Clemens Puppe, Johannes Philipp Reiß
T-WIWI-102859	Social Choice Theory (S. 472)	4,5	Clemens Puppe
T-WIWI-102613	Auction Theory (S. 232)	4,5	Karl-Martin Ehrhart
T-WIWI-105781	Incentives in Organizations (S. 337)	4,5	Petra Nieken

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The overall grade of the the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
None

Qualification Objectives
Students

- are able to model practical microoeconomic problems mathematically and to analyze them with respect to positive and normative questions,
- understand individual incentives and social outcomes of different institutional designs.

An example of a positive question is: which regulation policy results in which firm decistions under imperfect competition?
An example of a normative question is: which voting rule has appealing properties?

Content
The student should gain an understanding of advanced topics in economic theory, game theory and welfare economics. Core topics are, among others, strategic interactions in markets, cooperative and non-cooperative bargaining (Advanced Game Theory), allocation under asymmetric information and general equilibrium over time (Advanced Topics in Economic Theory), voting and the aggregation of preferences and judgements (Social Choice Theory).

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Operations Research in Supply Chain Management [M-WIWI-102832]

Responsibility: Stefan Nickel

Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective

Contained in: Operations Management - Data Analysis - Informatics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	2 terms	German	5

Wahlpflichtangebot
Non-Compulsory Block; You must choose at most 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-102723	Graph Theory and Advanced Location Models (S. 330)	4,5	Stefan Nickel
T-WIWI-106200	Modeling and OR-Software: Advanced Topics (S. 380)	4,5	Stefan Nickel
T-WIWI-102715	Operations Research in Supply Chain Management (S. 409)	4,5	Stefan Nickel

Ergänzungsangebot
Non-Compulsory Block; You must choose at most 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-106546	Introduction to Stochastic Optimization (S. 354)	4,5	Steffen Rebennack
T-WIWI-102718	Discrete-Event Simulation in Production and Logistics (S. 280)	4,5	Stefan Nickel
T-WIWI-102719	Mixed Integer Programming I (S. 377)	4,5	Oliver Stein
T-WIWI-102720	Mixed Integer Programming II (S. 378)	4,5	Oliver Stein
T-WIWI-106549	Large-scale Optimization (S. 359)	4,5	Steffen Rebennack
T-WIWI-102704	Facility Location and Strategic Supply Chain Management (S. 304)	4,5	Stefan Nickel
T-WIWI-102714	Tactical and Operational Supply Chain Management (S. 500)	4,5	Stefan Nickel

Learning Control / Examinations

The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.
The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

At least one of the courses "Operations Research in Supply Chain Management", "Graph Theory and Advanced Location Models", "Modeling and OR-Software: Advanced Topics" and"Special Topics of Stochastic Optimization (elective)" has to be taken.

Qualification Objectives

The student

- is familiar with basic concepts and terms of Supply Chain Management,
- knows the different areas of SCM and their respective optimization problems,
- is acquainted with classical location problem models (in planes, in networks and discrete) as well as fundamental methods for distribution and transport planning, inventory planning and management,
- is able to model practical problems mathematically and estimate their complexity as well as choose and adapt appropriate solution methods.

Content

Supply Chain Management is concerned with the planning and optimization of the entire, inter-company procurement, production and distribution process for several products taking place between different business partners (suppliers, logistics service providers, dealers). The main goal is to minimize the overall costs while taking into account several constraints including the satisfaction of customer demands.

This module considers several areas of SCM. On the one hand, the determination of optimal locations within a supply chain is addressed. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of Supply Chains. Thoroughly carried out, location planning tasks allow an efficient flow of materials and lead to lower costs and increased customer service. On the other hand, the planning of material transport in the context of supply chain management represents another focus of this module. By linking transport connections and different facilities, the material source (production plant) is connected with the material sink (customer). For given material flows or shipments, it is considered how to choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in Suppy Chain Mangement, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

Recommendations

Basic knowledge as conveyed in the module*Introduction toOperations Research*[WI1OR] is assumed.

Remarks

Some lectures and courses are offered irregularly.

The planned lectures and courses for the next three years are announced online.

Workload

Total effort for 9 credits: ca. 270 hours

- Presence time: 84 hours
- Preparation/Wrap-up: 112 hours
- Examination and examination preparation: 74 hours

M Module: Seminar [M-WIWI-102971]

Responsibility: Hagen Lindstädt, Oliver Stein

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Seminar in Economics and Management
Elective Field

ECTS	Language	Version
3	German	1

Wahlpflichtangebot
Non-Compulsory Block; You must choose 3 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-103474	Seminar in Business Administration A (Master) (S. 438)	3	Wolf Fichtner, Hansjörg Fromm, Andreas Geyer-Schulz, Ju-Young Kim, Martin Klarmann, Peter Knauth, Hagen Lindstädt, David Lorenz, Torsten Luedecke, Thomas Lützkendorf, Alexander Mädche, Bruno Neibecker, Stefan Nickel, Petra Nieken, Martin Ruckes, Gerhard Satzger, Frank Schultmann, Thomas Setzer, Orestis Terzidis, Marliese Uhrig-Homburg, Maxim Ulrich, Christof Weinhardt, Marion Weissenberger-Eibl, Ute Werner, Marcus Wouters
T-WIWI-103478	Seminar in Economics A (Master) (S. 450)	3	Johannes Brumm, Jan Kowalski, Kay Mitusch, Ingrid Ott, Clemens Puppe, Johannes Philipp Reiß, Nora Szech, Berthold Wigger
T-WIWI-103483	Seminar in Statistics A (Master) (S. 464)	3	Oliver Grothe, Melanie Schienle

Learning Control / Examinations
The modul examination consists of one seminar (according to §4 (3), 3 of the examintaion regulation). A detailed description of the assessment is given in the specific course characerization.
The final mark for the module is the mark of the seminar.

Conditions
None.

Qualification Objectives
The students are in a position to independently handle current, research-based tasks according to scientific criteria.
- They are able to research, analyze, abstract and critically review the information.
- They can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- They can logically and systematically present the obtained results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

Content

Competences which are gained in the seminar module especially prepare the student for composing the final thesis. Within the term paper and the presentation the student exercises himself in scientific working techniques supported by the supervisor.
Beside advancing skills in techniques of scientific working there are gained integrative key qualifications as well. A detailled description o these qualifications is given in the section "Key Qualifications" of the module handbook.
Furthermore, the module also includes additional key qualifications provided by the KQ-courses.

Recommendations

None.

Remarks

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required. The available places are listed on the internet: https://portal.wiwi.kit.edu.

M Module: Seminar [M-WIWI-102973]

Responsibility: Hagen Lindstädt, Oliver Stein

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Seminar in Economics and Management
Elective Field

ECTS	Language	Version
3	German	1

Wahlpflichtangebot
Non-Compulsory Block; You must choose 3 credits.

Identifier	Course	ECTS	Responsibility
T-WIWI-103479	Seminar in Informatics A (Master) (S. 454)	3	Andreas Oberweis, Harald Sack, Ali Sunyaev, York Sure-Vetter, Melanie Volkamer, Johann Marius Zöllner
T-WIWI-103481	Seminar in Operations Research A (Master) (S. 460)	3	Stefan Nickel, Steffen Rebennack, Oliver Stein

Learning Control / Examinations
The modul examination consists of one seminar (according to §4 (3), 3 of the examintaion regulation). A detailed description of the assessment is given in the specific course characerization.
The final mark for the module is the mark of the seminar.

Conditions
None.

Qualification Objectives
The students are in a position to independently handle current, research-based tasks according to scientific criteria.
- They are able to research, analyze, abstract and critically review the information.
- They can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- They can logically and systematically present the obtained results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

Content
Competences which are gained in the seminar module especially prepare the student for composing the final thesis. Within the term paper and the presentation the student exercises himself in scientific working techniques supported by the supervisor.
Beside advancing skills in techniques of scientific working there are gained integrative key qualifications as well. A detailled description o these qualifications is given in the section "Key Qualifications" of the module handbook.
Furthermore, the module also includes additional key qualifications provided by the KQ-courses.

Recommendations
None.

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required. The available places are listed on the internet: https://portal.wiwi.kit.edu.

M Module: Seminar [M-WIWI-102972]

Responsibility: Hagen Lindstädt, Oliver Stein

Organisation: KIT-Fakultät für Wirtschaftswissenschaften
Curricular Anchorage: Compulsory Elective
Contained in: Elective Field

ECTS	Recurrence	Duration	Language	Version
3	Each term	1 term	German/English	1

Wahlplfichtangebot
Non-Compulsory Block; You must choose one course.

Identifier	Course	ECTS	Responsibility
T-WIWI-103476	Seminar in Business Administration B (Master) (S. 444)	3	Wolf Fichtner, Hansjörg Fromm, Andreas Geyer-Schulz, Ju-Young Kim, Martin Klarmann, Peter Knauth, Hagen Lindstädt, David Lorenz, Torsten Luedecke, Thomas Lützkendorf, Alexander Mädche, Bruno Neibecker, Stefan Nickel, Petra Nieken, Martin Ruckes, Gerhard Satzger, Frank Schultmann, Thomas Setzer, Orestis Terzidis, Marliese Uhrig-Homburg, Maxim Ulrich, Christof Weinhardt, Marion Weissenberger-Eibl, Ute Werner, Marcus Wouters
T-WIWI-103477	Seminar in Economics B (Master) (S. 452)	3	Johannes Brumm, Jan Kowalski, Kay Mitusch, Ingrid Ott, Clemens Puppe, Johannes Philipp Reiß, Nora Szech, Berthold Wigger
T-WIWI-103484	Seminar in Statistics B (Master) (S. 465)	3	Oliver Grothe, Melanie Schienle

Learning Control / Examinations
The modul examination consists of one seminar (according to §4 (3), 3 of the examintaion regulation). A detailed description of the assessment is given in the specific course characerization.
The final mark for the module is the mark of the seminar

Conditions
None.

Qualification Objectives

- The students are in a position to independently handle current, research-based tasks according to scientific criteria.
- They are able to research, analyze, abstract and critically review the information.
- They can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- They can logically and systematically present the obtained results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

Content

Competences which are gained in the seminar module especially prepare the student for composing the final thesis. Within the term paper and the presentation the student exercises himself in scientific working techniques supported by the supervisor.

Beside advancing skills in techniques of scientific working there are gained integrative key qualifications as well.

Remarks

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: https://portal.wiwi.kit.edu.

Workload

he total workload for this module is approximately 90 hours.

M Module: Seminar [M-WIWI-102974]

Responsibility: Hagen Lindstädt, Oliver Stein

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Elective Field

ECTS	Recurrence	Duration	Language	Version
3	Each term	1 term	German/English	1

Wahlplfichtangebot

Non-Compulsory Block; You must choose one course.

Identifier	Course	ECTS	Responsibility
T-WIWI-103480	Seminar in Informatics B (Master) (S. 457)	3	Andreas Oberweis, Harald Sack, Ali Sunyaev, York Sure-Vetter, Melanie Volkamer, Johann Marius Zöllner
T-WIWI-103482	Seminar in Operations Research B (Master) (S. 462)	3	Stefan Nickel, Steffen Rebennack, Oliver Stein

Learning Control / Examinations

The modul examination consists of one seminar (according to §4 (3), 3 of the examintaion regulation). A detailed description of the assessment is given in the specific course characerization.
The final mark for the module is the mark of the seminar

Conditions

None.

Qualification Objectives

- The students are in a position to independently handle current, research-based tasks according to scientific criteria.
- They are able to research, analyze, abstract and critically review the information.
- They can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- They can logically and systematically present the obtained results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

Content

Competences which are gained in the seminar module especially prepare the student for composing the final thesis. Within the term paper and the presentation the student exercises himself in scientific working techniques supported by the supervisor.
Beside advancing skills in techniques of scientific working there are gained integrative key qualifications as well.

Remarks

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

Workload

he total workload for this module is approximately 90 hours.

M Module: Service Operations [M-WIWI-102805]

Responsibility: Stefan Nickel

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Operations Management - Data Analysis - Informatics
Additional Examinations

ECTS	Recurrence	Duration	Language	Version
9	Each term	1 term	German	5

Wahlpflichtangebot
Non-Compulsory Block; You must choose at most 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-102718	Discrete-Event Simulation in Production and Logistics (S. 280)	4,5	Stefan Nickel
T-WIWI-102884	Operations Research in Health Care Management (S. 408)	4,5	Stefan Nickel
T-WIWI-102715	Operations Research in Supply Chain Management (S. 409)	4,5	Stefan Nickel
T-WIWI-102716	Practical Seminar: Health Care Management (with Case Studies) (S. 421)	4,5	Stefan Nickel

Ergänzungsangebot
Non-Compulsory Block; You must choose at most 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-102860	Supply Chain Management in the Process Industry (S. 498)	4,5	Stefan Nickel
T-WIWI-102872	Challenges in Supply Chain Management (S. 247)	4,5	Esther Mohr

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO), whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

At least one of the fourcourses Operations Research in Supply Chain Management, Operations Research in Health Care Management, Practical seminar: Health Care Management orDiscrete-Event Simulation in Production and Logistics has to be assigned.

Qualification Objectives

Students

- knows the theoretical bases and the key components of Business Intelligence systems,
- acquires the basic skills to make use of business intelligence and analytics software in the service context
- are introduced into various application scenarios of analytics in the service context
- are able to distinguish different analytics methods and apply them in context
- learn how to apply analytics software in the service context

- are trained for the structured compilation and solution of practice relevant problems with the help of commercial business intelligence software packages as well as analytics methods and tools

Content
The importance of services in modern economies is most evident – nearly 70% of gross value added are achieved in the tertiary sector and a growing number of industrial enterprises add customer specific services to their material goods or transform their business models fundamentally. The growing availability of data "Big Data" and their intelligent processing by applying analytic methods and business intelligence systems plays a key role.
It is the goal of the module to give students a comprehensive overview on the subject Business Intelligence & Analytics focusing on service issues. Various scenarios illustrate how the methods and systems introduced help to improve existing services or create innovative data-based services.

Recommendations
The course Practical Seminar Health Care should be combined with the course OR in Health Care Management.

Remarks
This module is part of the KSRI teaching profile "Digital Service Systems". Further information on a service-specific profiling is available under www.ksri.kit.edu/teaching.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.

M Module: Stochastic Optimization [M-WIWI-103289]

Responsibility: Steffen Rebennack

Organisation: KIT-Fakultät für Wirtschaftswissenschaften

Curricular Anchorage: Compulsory Elective

Contained in: Operations Management - Data Analysis - Informatics
Elective Field
Additional Examinations

ECTS	Recurrence	Duration	Version
9	Each term	1 term	5

Wahlpflichtangebot
Non-Compulsory Block; You must choose at most 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-106546	Introduction to Stochastic Optimization (S. 354)	4,5	Steffen Rebennack
T-WIWI-106548	Advanced Stochastic Optimization (S. 221)	4,5	Steffen Rebennack
T-WIWI-106549	Large-scale Optimization (S. 359)	4,5	Steffen Rebennack

Ergänzungsangebot
Non-Compulsory Block; You must choose at most 2 courses.

Identifier	Course	ECTS	Responsibility
T-WIWI-102723	Graph Theory and Advanced Location Models (S. 330)	4,5	Stefan Nickel
T-WIWI-102719	Mixed Integer Programming I (S. 377)	4,5	Oliver Stein
T-WIWI-102720	Mixed Integer Programming II (S. 378)	4,5	Oliver Stein
T-WIWI-103124	Multivariate Statistical Methods (S. 383)	4,5	Oliver Grothe
T-WIWI-102715	Operations Research in Supply Chain Management (S. 409)	4,5	Stefan Nickel
T-WIWI-106545	Optimization under uncertainty (S. 412)	5	Steffen Rebennack
T-WIWI-106552	Simulation of Stochastic Systems (S. 468)	4,5	Oliver Grothe, Steffen Rebennack

Learning Control / Examinations
The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.
The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
At least one of the courses "Advanced Stochastic Optimization" and "Large-scale Optimization" has to be taken.

Qualification Objectives
The student

- names and describes basic notions for advanced stochastic optimization methods, in particular, ways to algorithmically exploit the special model structures,

- knows the indispensable methods and models for quantitative analysis of stochastic optimization problems,
- models and classifies stochastic optimization problems and chooses the appropriate solution methods to solve also challenging stochastic optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions,
- identifies drawbacks of the solution methods and, if necessary, is able to makes suggestions to adapt them to practical problems.

Content

The module focuses on the modeling as well as the imparting of theoretical principles and solution methods for optimization problems with special structure, which occur for example in the stochastic optimization.

Recommendations

It is recommended to listen to the lecture "Introduction to Stochastic Optimization" before the lecture "Advanced Stochastic Optimization" is visited.

Remarks

The course "Introduction to Stochastic Optimization" will be offered until the winter semester 2018/2019 as an additional option in the elective offer of the module. Thereafter, the course can only be selected in the supplementary offer.
The courses are sometimes offered irregularly. The curriculum, planned for three years in advance, can be found on the Internet at http://sop.ior.kit.edu/28.php.

Workload

The total workload for this module is approximately 270 hours (9 credits). The allocation is made according to the credit points of the courses of the module. The total number of hours per course is determined by the amount of time spent attending the lectures and exercises, as well as the exam times and the time required to achieve the module's learning objectives for an average student for an average performance.

Part V

Courses

T Course: Spin Manifolds, Alpha Invariant and Positive Scalar Curvature [T-MATH-105932]

Responsibility: Stephan Klaus, Wilderich Tuschmann
Contained in: [M-MATH-102958] Spin Manifolds, Alpha Invariant and Positive Scalar Curvature

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

T Course: Adaptive finite element methods [T-MATH-108404]

Responsibility: Tobias Jahnke
Contained in: [M-MATH-104060] Adaptive finite element methods

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung mündlich	1

Conditions
None

T Course: Adaptive Finite Element Methods [T-MATH-105898]

Responsibility: Willy Dörfler
Contained in: [M-MATH-102900] Adaptive Finite Elemente Methods

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

Conditions
none

T Course: Advanced Game Theory [T-WIWI-102861]

Responsibility: Karl-Martin Ehrhart, Clemens Puppe, Johannes Philipp Reiß
Contained in: [M-WIWI-101500] Microeconomic Theory
[M-WIWI-101502] Economic Theory and its Application in Finance
[M-WIWI-102970] Decision and Game Theory

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2521533	Advanced Game Theory	Vorlesung (V)	2	Karl-Martin Ehrhart, Michael Müller, Clemens Puppe
WS 18/19	2521534		Übung (Ü)	1	Michael Müller, Clemens Puppe

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None

Recommendations
Basic knowledge of mathematics and statistics is assumed.

V Event excerpt: Advanced Game Theory (WS 18/19)

Aim
The student
- deepens and broadens his/her basic knowledge of Game Theory,
- develops a rigorous understanding of newer concepts in Game Theory,
- develops the capability to independently model and analyze complex systems of strategic decision-making, and to develop appropriate solutions.

Content
This course offers an advanced and rigorous treatment of game theory.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

T Course: Advanced Inverse Problems: Nonlinearity and Banach Spaces [T-MATH-105927]

Responsibility: Andreas Rieder
Contained in: [M-MATH-102955] Advanced Inverse Problems: Nonlinearity and Banach Spaces

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0123000		Vorlesung (V)	2	Andreas Rieder
WS 18/19	0123010		Übung (Ü)	2	Andreas Rieder

Conditions
none

T Course: Advanced Lab Informatics [T-WIWI-103523]

Responsibility: Andreas Oberweis, Harald Sack, Ali Sunyaev, York Sure-Vetter, Melanie Volkamer, Johann Marius Zöllner

Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
4	deutsch/englisch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2400115	Machine Learning Practical Course	Praktikum (P)	3	Rüdiger Dillmann, Johann Marius Zöllner
SS 2018	2512101		Praktikum (P)	3	Andreas Drescher, Andreas Oberweis, Frederic Toussaint, Meike Ullrich
SS 2018	2512300		Seminar / Praktikum (S/P)	3	Aditya Mogadala, Achim Rettinger, York Sure-Vetter, Steffen Thoma
SS 2018	2512400		Praktikum (P)		Theresa Kromat, Ali Sunyaev
SS 2018	2512500		Praktikum (P)	3	Johann Marius Zöllner
SS 2018	2512550	Advanced Lab Privacy Friendly Apps	Praktikum (P)	3	Oksana Kulyk, Peter Mayer, Melanie Volkamer
SS 2018	2513306	Data Science & Real-time Big Data Analytics	Seminar / Praktikum (S/P)	2	Dominik Riemer, Suad Sejdovic, York Sure-Vetter
WS 18/19	2512100	Security	Praktikum (P)	4	Ingmar Baumgart, Sven Maier, Melanie Volkamer
WS 18/19	2512301	Linked Data and the Semantic Web	Seminar / Praktikum (S/P)	3	Maribel Acosta Deibe, Lars Heling, Tobias Christof Käfer, York Sure-Vetter, Tobias Weller
WS 18/19	2512311	Data Science with Open Data	Seminar / Praktikum (S/P)	3	Matthias Frank, York Sure-Vetter
WS 18/19	2512312	Cooperation seminar: Innovative applications on single board computers as well as their economic relevance	Seminar / Praktikum (S/P)	3	David Bälz, Ingrid Ott, York Sure-Vetter, Tobias Weller
WS 18/19	2512400		Praktikum (P)		Theresa Kromat, Ali Sunyaev
WS 18/19	2512501		Praktikum (P)	3	Johann Marius Zöllner
WS 18/19	2512551		Praktikum (P)	3	Melanie Volkamer
WS 18/19	2512600		Praktikum (P)	2	Harald Sack

Learning Control / Examinations
Advanced Lab "Privacy Friendly Apps":
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of of a practical work in which a software functionality must be implemented and three interim submissions of the software to be developed. The weighting of the individual components will be announced during the first meeting.
All other courses of the Institute AIFB:
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

- a practical work
- a presentation and
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

Conditions
None

Remarks
The title of this course is a generic one. Specific titles and the topics of offered seminars will be announced before the start of a semester in the internet at https://portal.wiwi.kit.edu.

V Event excerpt: Linked Data and the Semantic Web (WS 18/19)

Workload
Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

V Event excerpt: Machine Learning Practical Course (SS 2018)

Aim
Umsetzung einzelner, durch die Studenten ausgewählter Verfahren des Maschinellen Lernens an einer konkreten Aufgabenstellung entweder aus dem Bereich Robotik oder kognitive Automobile.

Die einzelnen Projekte erfordern die Analyse der gestellten Aufgabe, Auswahl geeigneter Lernverfahren, Spezifikation und Implementierung und Evaluierung eines Lösungsansatzes. Schließlich ist die gewählte Lösung zu dokumentieren und in einem Kurzvortrag vorzustellen.
Die Studierenden können Kenntnisse aus der Vorlesung Maschinelles Lernen auf einem ausgewählten Gebiet der aktuellen Forschung im Bereich Robotik oder kognitive Automobile praktisch anwenden.
Die Studierenden beherrschen die Analyse und Lösung entsprechender Problemstellungen im Team.
Die Studierenden können ihre Konzepte und Ergebnisse evaluieren, dokumentieren und präsentieren.

V Event excerpt: (SS 2018)

Content
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

Literature
Detailed references are indicated together with the respective subjects. For general background information look up the following textbooks:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

V Event excerpt: (WS 18/19)

Aim

- Independent and self-organized realization of a software development project
- Evaluation and selection of suitable development tools and methods
- Application of modern software development methods
- Planning and execution of different development tasks: requirements assessment, system design, implementation, and quality assurance
- Project documentation
- Presentation of project results in an comprehensible and structured form

Workload
4 ECTS = approx. 120 h

V Event excerpt: Cooperation seminar: Innovative applications on single board computers as well as their economic relevance (WS 18/19)

Content
Topics of interest include, but are not limited to:

- Smart Home Applications
- Environmental measurements
- Gesture control
- Security systems

V Event excerpt: Advanced Lab Privacy Friendly Apps (SS 2018)

Aim
The students

- are able to identify privacy-critical parts of an app and to model and implement them in a privacy-friendly way,
- know frameworks for the development of mobile apps as well as the dedicated development environments,
- have the ability to use "git" (on the example of Github) as a basis for software development,
- have experience in software development using "Human Centered Design".

Content
The Privacy Friendly Apps (PFAs) are a group of Android apps that are optimized regarding privacy. In the past, more than 20 Privacy Friendly Apps have been developed at the Technische Universität Darmstadt and published in the Google Playstore as well as in the alternative App Store F-Droid. The source code of each Privacy Friendly App is available on Github and licensed "open-source". The "Privacy Friendly QR Scanner" was downloaded more than 15,000 times from the Playstore. Further information can be found at https://secuso.org/pfa.
In the practical course "Privacy Friendly Apps", apps are implemented in small groups or existing Privacy Friendly Apps are extended. Initially, Android apps will be in the foreground. In the medium term, it is planned to develop IOS apps as well.
The focus of the practical course is on the privacy-friendly and user-centered implementation of the respective task as an app. Therefore, privacy-critical points are identified and technical measures for the protection of privacy (for example the blocking of screenshots) as well as for the support of the user (for example explanations) are determined. These will be implemented during the internship.

V Event excerpt: (WS 18/19)

Aim

Die Studierenden können Kenntnisse aus der Vorlesung Maschinelles Lernen auf einem ausgewählten Gebiet der aktuellen Forschung im Bereich Robotik oder kognitive Automobile praktisch anwenden.
Die Studierenden beherrschen die Analyse und Lösung entsprechender Problemstellungen im Team.
Die Studierenden können ihre Konzepte und Ergebnisse evaluieren, dokumentieren und präsentieren.

Workload

Der Arbeitsaufwand von 3 SWS setzt sich zusammen aus Präsenzzeit am Versuchsort zur praktischen Umsetzung der gewählten Lösung, sowie der Zeit für Literaturrecherchen und Planung/Spezifikation der geplanten Lösung. Zusätzlich wird ein kurzer Bericht und eine Präsentation der durchgeführten Arbeit erstellt.

V Event excerpt: (SS 2018)

Aim

Die Studierenden können Kenntnisse aus der Vorlesung Maschinelles Lernen auf einem ausgewählten Gebiet der aktuellen Forschung im Bereich Robotik oder kognitive Automobile praktisch anwenden.
Die Studierenden beherrschen die Analyse und Lösung entsprechender Problemstellungen im Team.
Die Studierenden können ihre Konzepte und Ergebnisse evaluieren, dokumentieren und präsentieren.

Content

Umsetzung einzelner, durch die Studenten ausgewählter Verfahren des Maschinellen Lernens an einer konkreten Aufgabenstellung entweder aus dem Bereich Robotik oder kognitive Automobile.

Die einzelnen Projekte erfordern die Analyse der gestellten Aufgabe, Auswahl geeigneter Lernverfahren, Spezifikation und Implementierung und Evaluierung eines Lösungsansatzes. Schließlich ist die gewählte Lösung zu dokumentieren und in einem Kurzvortrag vorzustellen.

Workload

Der Arbeitsaufwand von 3 SWS setzt sich zusammen aus Präsenzzeit am Versuchsort zur praktischen Umsetzung der gewählten Lösung, sowie der Zeit für Literaturrecherchen und Planung/Spezifikation der geplanten Lösung. Zusätzlich wird ein kurzer Bericht und eine Präsentation der durchgeführten Arbeit erstellt.

T Course: Advanced Lab Security, Usability and Society [T-WIWI-108439]

Responsibility: Melanie Volkamer
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
4	Jedes Wintersemester	Prüfungsleistung anderer Art	1

Learning Control / Examinations
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

- a practical work
- a presentation and possibly
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

Conditions
None

Recommendations
Knowledge from the lecture "Information Security" is recommended.

Remarks
The course is expected to be offered from winter term 2018/2019.

Contents:
In the course of the programming lab, changing topics from the field of Human Factors in Security und Privacy will be worked on.

Learning goals:
The student

- can apply the basics of information security
- is able to implement appropriate measures to achieve different protection goals
- can structure a software project in the field of information security
- can use the Human Centred Security and Privacy by Design technique to develop user-friendly software
- can explain and present technical facts and the results of the programming lab in oral and written form

T Course: Advanced Lab User Studies in Security [T-WIWI-109271]

Responsibility: Melanie Volkamer
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
4	Jedes Sommersemester	Prüfungsleistung anderer Art	1

Learning Control / Examinations
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

- a practical work
- a presentation and possibly
- a written seminar thesis

Practical work, presentation and written thesis are weighted according to the course.

Conditions
None

T Course: Advanced Statistics [T-WIWI-103123]

Responsibility: Oliver Grothe
Contained in: [M-WIWI-101637] Analytics and Statistics

ECTS	Language	Recurrence	Exam type	Version
4.5	I	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2550552		Vorlesung (V)	2	Oliver Grothe
WS 18/19	2550553		Übung (Ü)	2	Maximilian Coblenz, Oliver Grothe, Anika Kaplan

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. A bonus program can improve the grade by one grade level (i.e. by 0.3 or 0.4). The exam is offered every semester. Re-examinations are offered only for repeaters.

Conditions
None

Remarks
New course starting winter term 2015/2016

V Event excerpt: (WS 18/19)

Aim
Students

- cope with advanced fundamentals of statistics as well as simulation and resampling methods.
- know the fundamentals of point and interval estimation as well as testing of hypotheses.
- know basic principles of information theory.
- learn, how to conduct controlled simulation studies.

Content
Basic principles
Types of convergence and limit theorems
Multivariate Distributions
Copulas
Simulation techniques, Bootstrap
Statistical Estimation
Statistical Testing
Simulation studies

Literature
Comprehensive lecture notes

T Course: Advanced Stochastic Optimization [T-WIWI-106548]

Responsibility: Steffen Rebennack
Contained in: [M-WIWI-101473] Mathematical Programming
[M-WIWI-103289] Stochastic Optimization

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Conditions
None.

T Course: Advanced Topics in Economic Theory [T-WIWI-102609]

Responsibility: Kay Mitusch
Contained in: [M-WIWI-101500] Microeconomic Theory
[M-WIWI-101502] Economic Theory and its Application in Finance

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The course T-WIWI-102609 "Advanced Topics in Economic Theory" restarts in summer term 2019.
The assessment consists of a written exam (60min) (following §4(2), 1 of the examination regulation) at the end of the lecture period or at the beginning of the following semester.

Conditions
None

Recommendations
This course is designed for advanced Master students with a strong interest in economic theory and mathematical models. Bachelor students who would like to participate are free to do so, but should be aware that the level is much more advanced than in other courses of their curriculum.

T Course: Algebra [T-MATH-102253]

Responsibility: Frank Herrlich, Stefan Kühnlein
Contained in: [M-MATH-101315] Algebra

ECTS	Language	Exam type	Version
8	deutsch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0102200		Vorlesung (V)	4	Stefan Kühnlein
WS 18/19	0102210		Übung (Ü)	2	Stefan Kühnlein

T Course: Algebraic Geometry [T-MATH-103340]

Responsibility: Frank Herrlich, Stefan Kühnlein
Contained in: [M-MATH-101724] Algebraic Geometry

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Algebraic Number Theory [T-MATH-103346]

Responsibility: Stefan Kühnlein
Contained in: [M-MATH-101725] Algebraic Number Theory

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Algebraic Topology [T-MATH-105915]

Responsibility: Holger Kammeyer, Roman Sauer
Contained in: [M-MATH-102948] Algebraic Topology

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung schriftlich	1

Conditions
none

T Course: Algebraic Topology II [T-MATH-105926]

Responsibility: Roman Sauer
Contained in: [M-MATH-102953] Algebraic Topology II

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung schriftlich	1

Conditions
none

T Course: Applied Econometrics [T-WIWI-103125]

Responsibility: Melanie Schienle
Contained in: [M-WIWI-101638] Econometrics and Statistics I

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment of this course is a written examination (90 min) according to §4(2), 1 of the examination regulation.

Conditions
None

Remarks
The course is not offered regularly.

T Course: Applied Informatics II - IT Systems for eCommerce [T-WIWI-102651]

Responsibility: Ali Sunyaev
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511032	Applied Informatics II: IT Systems for e-Commerce	Vorlesung (V)	2	Ali Sunyaev
SS 2018	2511033		Übung (Ü)	1	Ali Sunyaev

Learning Control / Examinations
The assessment consists of a written exam (120 min) according to Section 4(2), 1 of the examination regulation.
The successful completion of the compulsory exercises is prerequisite for the admission to the written exam.
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.
By successful processing the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Conditions
None

Recommendations
Knowledge of content of the modules Foundations in Informatics [IW1INF1] and Algorithms I [IW2INF2] is expected.

V Event excerpt: Applied Informatics II: IT Systems for e-Commerce (SS 2018)

Aim
The student learns about concepts and technologies for designing big, distributed application architectures. Students apply industryrelevant technology to solve application-oriented problems in lab classes.

Content
The course Applied Informatics II [2511032] covers various facets of electronic commerce which have to be supported by adequate and efficient distributed information systems. Key topics are middleware technologies and distributed application architectures. Document description and exchange (incl. XML), Java EE, Web technologies, and Web services are additional topics.

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
Tba in the lecture.

T Course: Asset Pricing [T-WIWI-102647]

Responsibility: Martin Ruckes, Marliese Uhrig-Homburg
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101482] Finance 1
[M-WIWI-101502] Economic Theory and its Application in Finance
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530555	Asset Pricing	Vorlesung (V)	2	Martin Ruckes, Marliese Uhrig-Homburg
SS 2018	2530556		Übung (Ü)	1	Marcel Müller, Martin Ruckes, Marliese Uhrig-Homburg

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
We strongly recommend knowledge of the basic topics in investments (bachelor course), which will be necessary to be able to follow the course.

V Event excerpt: Asset Pricing (SS 2018)

Aim
Students are familiar with advanced concepts in asset pricing (in particular the stochastic discount factor model). They are able to apply their acquired skills to solve empirical questions related to securities.

Content
This lecture deals with the valuation of risky cash flows. A stochastic discount model and a central equation will be introduced, which form the basis of nearly every valuation model in finance. That includes the valuation of stocks, bonds and derivatives. The first part of the lecture will present the theory, the second part covers empirical questions related to this approach.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Basic literature

- Asset pricing / Cochrane, J.H. - Rev. ed., Princeton Univ. Press, 2005.

Elective literature

- Investments and Portfolio Management / Bodie, Z., Kane, A., Marcus, A.J. - 9. ed., McGraw-Hill, 2011.
- The econometrics of financial markets / Campbell, J.Y., Lo, A.W., MacKinlay, A.C. - 2. printing, with corrections, Princeton Univ. Press, 1997.

T Course: Asymptotic Stochastics [T-MATH-105866]

Responsibility: Vicky Fasen-Hartmann, Norbert Henze, Bernhard Klar
Contained in: [M-MATH-102902] Asymptotic Stochastics

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0118000		Vorlesung (V)	4	Norbert Henze
WS 18/19	0118100		Übung (Ü)	2	Norbert Henze

Conditions
none

T Course: Auction Theory [T-WIWI-102613]

Responsibility: Karl-Martin Ehrhart
Contained in: [M-WIWI-101500] Microeconomic Theory
[M-WIWI-102970] Decision and Game Theory

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2520408		Vorlesung (V)	2	Karl-Martin Ehrhart
WS 18/19	2520409		Übung (Ü)	1	Karl-Martin Ehrhart

Learning Control / Examinations
The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins.
The exam is offered each semester.

Conditions
None

V Event excerpt: (WS 18/19)

Aim
The student

- learns the game-theoretic modeling and analysis of auctions,
- learns about various auction formats and their specific characteristics,
- understands the challenge for participating in auctions as bidder,
- understands the challenge of designing auctions as auctioneer,
- gains insight into practice by case studies,
- participates in and analyzes demonstration experiments.

Content
This course deals with the analysis and modeling of auction which are based on game theory. This also includes aspects of applying and designing auctions as well as experiences with auctions. Main topics are:

- Single- and multi-unit auctions
- Selling and procurement auctions
- Electronic auctions (e.g. eBay, C2C, B2B)
- Multi-attributive auctions.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Ehrhart , K.-M. und S. Seifert: Auktionstheorie, Skript zur Vorlesung, KIT, 2011
- Krishna, V.: Auction Theory, Academic Press, Second Edition, 2010
- Milgrom, P.: Putting Auction Theory to Work, Cambridge University Press, 2004
- Ausubel, L.M. und P. Cramton: Demand Reduction and Inefficiency in Multi-Unit Auctions, University of Maryland, 1999

T Course: Automated Financial Advisory [T-WIWI-106495]

Responsibility: Maxim Ulrich
Contained in: [M-WIWI-103261] Disruptive FinTech Innovations

ECTS	Language	Recurrence	Exam type	Version
3	englisch	Jedes Sommersemester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530372	Automated Financial Advisory	Seminar (S)	2	Elmar Jakobs, Maxim Ulrich
WS 18/19	2500002	Automated Financial Advisory	Seminar (S)	2	Maxim Ulrich

Learning Control / Examinations
The grade consists of a written thesis and an oral presentation.

Conditions
There are two conditions for taking this course:

1. This course is only open for registered students of the module "Disruptive FinTech Innovations".
2. Registered students do also attend in the same semester the lecture "Engineering FinTech Solutions" and the programming internship "Computational FinTech with Python and C++".

Modeled Conditions
The following conditions must be met:

1. The course [T-WIWI-106193] *Engineering FinTech Solutions* must have been started.
2. The course [T-WIWI-106496] *Computational FinTech with Python and C++* must have been started.

V Event excerpt: Automated Financial Advisory (SS 2018)

Aim
In this seminar students work on issues related to the automatization of risk and investment management applications.

Content
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

V Event excerpt: Automated Financial Advisory (WS 18/19)

Aim
In this seminar students work on issues related to the automatization of risk and investment management applications.

Content
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

T Course: Bifurcation Theory [T-MATH-106487]

Responsibility: Rainer Mandel
Contained in: [M-MATH-103259] Bifurcation Theory

ECTS	Recurrence	Exam type	Version
5	Unregelmäßig	Prüfungsleistung mündlich	1

Conditions
None

T Course: Blockchains & Cryptofinance [T-WIWI-108880]

Responsibility: Philipp Schuster, Marliese Uhrig-Homburg
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2530567	Blockchains & Cryptofinance	Vorlesung (V)	2	Philipp Schuster, Marliese Uhrig-Homburg
WS 18/19	2530568		Übung (Ü)	1	Marcel Müller

Learning Control / Examinations
The assessment consists of a written exam (75 min) (§4(2), 1 of the examination regulations).

Conditions
None

Recommendations
None

Remarks
New course starting winter term 2018/2019.

V Event excerpt: Blockchains & Cryptofinance (WS 18/19)

Aim
Ziel der Veranstaltung ist es, die Studierenden mit den Grundlagen zu Blochchains und Kryptowährungen vertraut zu machen. Studierende werden in die Lage versetzt, eine einfache Blockchain selbst zu implementieren, Handelsstrategien mit Kryptowährungen umzusetzen und strategische Entscheidungen zur Einführung disruptiver Plattformtechnologien wie der Blockchain im Unternehmenskontext zu treffen.

Content
Nach einer Einführung in die krytografischen Grundlagen der Blockchain-Technologie behandelt die Vorlesung die verschiedenen Eigenschaften des Bitcoin-Netzwerkes. Hierbei wird auch auf die unterschiedlichen Akteure (Anwender, Miner, . . .) und ihre ökonomischen Anreize eingegangen. Im zweiten Teil der Vorlesung wird dann zunächst der Einsatz von Krytowährungen als Geldeinheiten diskutiert, bevor dann auf den Handel mit Kryptowährungen an Börsen sowie auf Bitcoin-Derivate eingegangen wird. Der dritte Teil soll potentielle Anwendungen der Blockchain-Technologie in einem Finanzsystem der Zukunft aufdecken. Zunächst werden dazu die Potentiale von Smart-Contracts diskutiert. Anschließend werden exemplarisch die Abwicklung von Wertpapiertransaktionen über dezentrale Systeme wie die Blockchain sowie Unternehmensfinanzierung über Kryptoassets (Inital Coin Offerings) besprochen.
In der begleitend zur Vorlesung angebotenen Übung werden u.a. eine eigene Blockchain implementiert, Arbitrage-Strategien mit Kryptowährungen analysiert sowie die Einführung disruptiver Plattformtechnologien wie der Blockchain im Unternehmenskontext diskutiert.

Workload
Gesamtaufwand bei 4,5 Leistungspunkten: ca. 135.0 Stunden
Präsenzzeit: 30 Stunden
Vor – und Nachbereitung der LV: 45.0 Stunden
Prüfung und Prüfungsvorbereitung: 60.0 Stunden

Literature
Narayanan, A.; J. Bonneau; E. Felten; A. Miller; S. Goldfeder (2016): Bitcoin and Crytocurrency Technologies – A

Comprehensive Introduction, Princeton University Press.
Schär, F., A. Berentsen (2017): Bitcoin, Blockchain und Kryptoassets: Eine umfassende Einführung, Books on Demand, 1. Auflage.

T Course: Bott Periodicity [T-MATH-108905]

Responsibility: Wilderich Tuschmann
Contained in: [M-MATH-104349] Bott Periodicity

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Unregelmäßig	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0106400		Vorlesung (V)	2	Stephan Klaus
WS 18/19	0106410		Übung (Ü)	2	Stephan Klaus

Conditions
none

T Course: Boundary and Eigenvalue Problems [T-MATH-105833]

Responsibility: Dirk Hundertmark, Tobias Lamm, Michael Plum, Wolfgang Reichel, Jens Rottmann-Matthes, Roland Schnaubelt, Lutz Weis

Contained in: [M-MATH-102871] Boundary and Eigenvalue Problems

ECTS	Language	Exam type	Version
8	deutsch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0157500		Vorlesung (V)	4	Rainer Mandel
SS 2018	0157600		Übung (Ü)	2	Rainer Mandel

T Course: Brownian Motion [T-MATH-105868]

Responsibility: Nicole Bäuerle, Vicky Fasen-Hartmann, Günter Last
Contained in: [M-MATH-102904] Brownian Motion

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	1

Conditions
none

T Course: Building Intelligent and Robo-Adviced Portfolios [T-WIWI-106442]

Responsibility: Maxim Ulrich
Contained in: [M-WIWI-103247] Intelligent Risk and Investment Advisory

ECTS	Recurrence	Exam type	Version
9	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations

No exam in winter semester 2018/2019.
There are two grading schemes. The student will be graded with the scheme that gives him the highest score. Grading Scheme A: 70% of the grade is based on the exam, 30% is based on problem sets and quizzes. Grading Scheme B: 100% of the grade is based on the exam.
The exam tests the material of the current semester and takes place during the lecture-free period. Students who don't pass the exam are allowed to re-take the exam.

Conditions

None.

Recommendations

Good skills in applied math modeling (differential equations).

Remarks

The course is not offered regularly.

T Course: Business Intelligence Systems [T-WIWI-105777]

Responsibility: Alexander Mädche, Mario Nadj, Peyman Toreini
Contained in: [M-WIWI-104068] Information Systems in Organizations

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2540422	Business Intelligence Systems	Vorlesung (V)	2 + 1	Alexander Mädche, Mario Nadj

Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.
Students receive one aggregated grade consisting of a written exam (60%) and the Business Intelligence System challenge (40%). The exam and the Business Intelligence System challenge need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the Business Intelligence System challenge.

Conditions
None

Recommendations
Basic knowledge on database systems is helpful.

V Event excerpt: Business Intelligence Systems (WS 18/19)

Aim
The students
- understand the theoretical foundations of key Business Intelligence concepts supporting decision making
- explore key capabilities of state-of-the-art Business Intelligence systems
- learn how to successfully implement and run Business Intelligence systems from multiple perspectives, e.g. architecture, governance, implementation projects, post-implementation management
- get hands-on experience by working with commercial Business Intelligence systems (SAP HANA and reporting clients) with real-world data

Content
- Conceptual Foundations
- Provisioning: ETL Process, Metadata, Data Warehouse & Data Marts and Big Data Technologies
- Consumption: Reporting, Dashboards and its relation to (Big Data) Analytics
- BI Strategy & Governance
- BI Implementation & Post-Implementation Management
- Business Intelligence System Challenge (in cooperation with industry partner)

Literature

Turban, E., Aronson, J., Liang T.-P., Sharda, R. 2008. "Decision Support and Business Intelligence Systems". Pearson.
Watson, H. J. 2014. "Tutorial: Big Data Analytics: Concepts, Technologies, and Applications," Communications of the Association for Information Systems (34), p. 24.
Arnott, D., and Pervan, G. 2014. "A critical analysis of decision support systems research revisited: The rise of design science," Journal of Information Technology (29:4), Nature Publishing Group, pp. 269–293 (doi: 10.1057/jit.2014.16).
Carlo, V. (2009). "Business intelligence: data mining and optimization for decision making". Editorial John Wiley and Sons, 308-317.
Chen, H., Chiang, R. H. L, and Storey, V. C. 2012. „Business Intelligence and Analytics: From Big Data to Big Impact," MIS Quarterly (36:4), pp. 1165-1188.

Davenport, T. 2014. Big Data @ Work, Boston, MA: Harvard Business Review.
Economist Intelligence Unit. 2015 “Big data evolution: Forging new corporate capabilities for the long term”
Power, D. J. 2008. “Decision Support Systems: A Historical Overview,” Handbook on Decision Support Systems, pp. 121–140 (doi: 10.1007/978-3-540-48713-5_7).
Sharma, R., Mithras, S., and Kankanhalli, A. 2014. „Transforming decision-making processes: a research agenda for understanding the impact of business analytics on organisations,“ European Journal of Information Systems (23:4), pp. 433-441.
Silver, M. S. 1991. “Decisional Guidance for Computer-Based Decision Support,” MIS Quarterly (15:1), pp. 105-122.

T Course: Business Process Modelling [T-WIWI-102697]

Responsibility: Andreas Oberweis
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2511210	Business Process Modelling	Vorlesung (V)	2	Andreas Drescher, Andreas Oberweis
WS 18/19	2511211		Übung (Ü)	1	Andreas Drescher, Agnes Koschmider

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Conditions
None

V Event excerpt: Business Process Modelling (WS 18/19)

Aim
Students

- describe goals of business process modeling and aplly different modeling languages,
- choose the appropriate modeling language according to a given context,
- use suitable tools for modeling business processes,
- apply methods for analysing and assessing process modells to evaluate specific quality characteristics of the process model.

Content
The proper modeling of relevant aspects of business processes is essential for an efficient and effective design and implementation of processes. This lecture presents different classes of modeling languages and discusses the respective advantages and disadvantages of using actual application scenarios. For that simulative and analytical methods for process analysis are introduced. In the accompanying exercise the use of process modeling tools is practiced.

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam 1h

Total: 150h

Literature

- M. Weske: Business Process Management: Concepts, Languages, Architectures. Springer 2012.

- F. Schönthaler, G.Vossen, A. Oberweis, T. Karl: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer 2012.

Further Literature will be given in the lecture.

T Course: Business Strategies of Banks [T-WIWI-102626]

Responsibility: Wolfgang Müller
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2530299	Business Strategies of Banks	Vorlesung (V)	2	Wolfgang Müller

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

V Event excerpt: Business Strategies of Banks (WS 18/19)

Aim
Students are are in a position to discuss the principles of commercial banking. They are familiar with fundamental concepts of bank management and are able to apply them.

Content
The management of a bank is in charge of the determination and implementation of business policy - taking into account all relevant endogenous and exogenous factors - that assures the bank's success in the long run. In this context, there exists a large body of banking models and theories which are helpful in describing the success and risk of a bank. This course is meant to be the bridging of banking theory and practical implementation. In the course of the lectures students will learn to take on the bank management's perspective.
The first chapter deals with the development of the banking sector. Making use of appropriate assumptions, a banking policy is developed in the second chapter. The design of bank services (ch. 3) and the adequate marketing plan (ch. 4) are then built on this framework. The operational business of banks must be guided by appropriate risk and earnings management (ch. 5 and 6), which are part of the overall (global) bank management (ch. 7). Chapter eight, at last, deals with the requirements and demands of bank supervision as they have significant impact on a bank's corporate policy.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Elective literature:

- A script is disseminated chapter by chapter during the course of the lecture.
- Hartmann-Wendels, Thomas; Pfingsten, Andreas; Weber, Martin; 2000, Bankbetriebslehre, 6th edition, Springer

T Course: Calculus of Variations [T-MATH-105853]

Responsibility: Andreas Kirsch, Tobias Lamm, Michael Plum, Wolfgang Reichel
Contained in: [M-MATH-102882] Calculus of Variations

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Challenges in Supply Chain Management [T-WIWI-102872]

Responsibility: Esther Mohr
Contained in: [M-WIWI-102805] Service Operations

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550494	Challenges in Supply Chain Management	Vorlesung (V)	3	Esther Mohr

Learning Control / Examinations
The assessment consists of a written paper and an oral exam of ca. 30-40 min (non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015)).

Conditions
None

Recommendations
Basic knowledge as conveyed in the module "Introduction to Operations Research" is assumed.

Remarks
The number of course participants is limited to 12 participants due to joint work in BASF project teams. Due to these capacity restrictions, registration before course start is required. For further information see the webpage of the course. The course is offered irregularly. The planned lectures and courses for the next three years are announced online.

V Event excerpt: Challenges in Supply Chain Management (SS 2018)

Aim
The student

- analyzes and evaluates current developments and approaches in the design and planning of supply chain strategis, especially with respect to future challenges in this area,
- explains and utilizes theoretical concepts and methods for the design and strategy of supply chains,
- - classifies and accounts for trend-setting theories in the SCM context such as Behavioral Supply Chain Management or Supply Chain Analytics.

Content
The course consists of case studies of BASF which cover future challenges of supply chain management. Thus, the course aims at a case-study based presentation, critical evaluation and exemplary discussion of recent questions in supply chain management. The focus lies on future challenges and trends, also with regard to their applicability in practical cases (especially in the chemical industry).
The main part of the course is working on a project together with BASF in Ludwigshafen. The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the project topic.
This course will include working on cutting edge supply chain topics like Industry 4.0 / "Internet of Everything in production", supply chain analytics, risk management, procurement and production in SCM. The team essays / project reports will be linked to industry-related challenges as well as to upcoming theoretical concepts. The topics of the seminar will be announced at the beginning of the term in a preliminary meeting.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
To be defined depending on the topic.

T Course: Classical Methods for Partial Differential Equations [T-MATH-105832]

Responsibility: Dirk Hundertmark, Tobias Lamm, Michael Plum, Wolfgang Reichel, Jens Rottmann-Matthes, Roland Schnaubelt, Lutz Weis

Contained in: [M-MATH-102870] Classical Methods for Partial Differential Equations

ECTS	Language	Exam type	Version
8	deutsch	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0105300	Classical Methods for Partial Differential Equations	Vorlesung (V)	4	Wolfgang Reichel
WS 18/19	0105310	Classical Methods for Partial Differential Equations - Pass	Übung (Ü)	2	Wolfgang Reichel

T Course: Combinatorics [T-MATH-105916]

Responsibility: Maria Aksenovich
Contained in: [M-MATH-102950] Combinatorics

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung schriftlich	1

Conditions
none

T Course: Commutative Algebra [T-MATH-108398]

Responsibility: Frank Herrlich
Contained in: [M-MATH-104053] Commutative Algebra

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0159800		Vorlesung (V)	4	Fabian Januszewski
SS 2018	0159810		Übung (Ü)	2	Fabian Januszewski

Conditions
none

T Course: Comparison Geometry [T-MATH-105917]

Responsibility: Wilderich Tuschmann
Contained in: [M-MATH-102940] Comparison Geometry

ECTS	Recurrence	Exam type	Version
5	Unregelmäßig	Prüfungsleistung mündlich	1

Conditions
Keine

T Course: Comparison of numerical integrators for nonlinear dispersive equations [T-MATH-109040]

Responsibility: Katharina Schratz
Contained in: [M-MATH-104426] Comparison of numerical integrators for nonlinear dispersive equations

ECTS	Recurrence	Exam type	Version
4	Unregelmäßig	Prüfungsleistung schriftlich	1

Conditions
none

T Course: Complex Analysis [T-MATH-105849]

Responsibility: Gerd Herzog, Michael Plum, Wolfgang Reichel, Christoph Schmoeger, Roland Schnaubelt, Lutz Weis
Contained in: [M-MATH-102878] Complex Analysis

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Compressive Sensing [T-MATH-105894]

Responsibility: Andreas Rieder
Contained in: [M-MATH-102935] Compressive Sensing

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

T Course: Computational Economics [T-WIWI-102680]

Responsibility: Pradyumn Kumar Shukla
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2590458	Computational Economics	Vorlesung (V)	2	Pradyumn Kumar Shukla
WS 18/19	2590459		Übung (Ü)	1	Pradyumn Kumar Shukla

Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulation). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4). The bonus only applies to the first and second exam of the semester in which it was obtained.

Conditions
None

Remarks
The credits have been changed to 5 starting summer term 2016.

V Event excerpt: Computational Economics (WS 18/19)

Aim
The student

- understands the methods of Computational Economics and applies them on practical issues,
- evaluates agent models considering bounded rational behaviour and learning algorithms,
- analyses agent models based on mathematical basics,
- knows the benefits and disadvantages of the different models and how to use them,
- examines and argues the results of a simulation with adequate statistical methods,
- is able to support the chosen solutions with arguments and can explain them.

Content
Examining complex economic problems with classic analytical methods usually requires making numerous simplifying assumptions, for example that agents behave rationally or homogeneously. Recently, widespread availability of computing power gave rise to a new field in economic research that allows the modeling of heterogeneity and forms of bounded rationality: Computational Economics. Within this new discipline, computer based simulation models are used for analyzing complex economic systems. In short, an artificial world is created which captures all relevant aspects of the problem under consideration. Given all exogenous and endogenous factors, the modelled economy evolves over time and different scenarios can be analyzed. Thus, the model can serve as a virtual testbed for hypothesis verification and falsification.

Literature

- R. Axelrod: "Advancing the art of simulation in social sciences". R. Conte u.a., Simulating Social Phenomena, Springer, S. 21-40, 1997.
- R. Axtel: "Why agents? On the varied motivations for agent computing in the social sciences". CSED Working Paper No. 17, The Brookings Institution, 2000.
- K. Judd: "Numerical Methods in Economics". MIT Press, 1998, Kapitel 6-7.

- A. M. Law and W. D. Kelton: "Simulation Modeling and Analysis", McGraw-Hill, 2000.
- R. Sargent: "Simulation model verification and validation". Winter Simulation Conference, 1991.
- L. Tesfation: "Notes on Learning", Technical Report, 2004.
- L. Tesfatsion: "Agent-based computational economics". ISU Technical Report, 2003.

Elective literature:

- Amman, H., Kendrick, D., Rust, J.: "Handbook of Computational Economics". Volume 1, Elsevier North-Holland, 1996.
- Tesfatsion, L., Judd, K.L.: "Handbook of Computational Economics". Volume 2: Agent-Based Computational Economics, Elsevier North-Holland, 2006.
- Marimon, R., Scott, A.: "Computational Methods for the Study of Dynamic Economies". Oxford University Press, 1999.
- Gilbert, N., Troitzsch, K.: "Simulation for the Social Scientist". Open University Press, 1999.

T Course: Computational FinTech with Python and C++ [T-WIWI-106496]

Responsibility:
Contained in: [M-WIWI-103261] Disruptive FinTech Innovations

ECTS	Language	Recurrence	Exam type	Version
1.5	englisch	Jedes Sommersemester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530373	Computational FinTech with Python and C++	Praktikum (P)	1,5	Elmar Jakobs, Maxim Ulrich
WS 18/19	2500003	Computational FinTech with Python and C++	Praktikum (P)	1,5	Maxim Ulrich

Learning Control / Examinations
The grade is based on a larger or several smaller programming exercises.

Conditions
There are two conditions for taking this course:

1. This course is only open for registered students of the module "Disruptive FinTech Innovations".
2. Registered students do also attend in the same semester the lecture "Engineering FinTech Solutions" and the seminar "Automated Financial Advisory".

Modeled Conditions
The following conditions must be met:

1. The course [T-WIWI-106193] *Engineering FinTech Solutions* must have been started.
2. The course [T-WIWI-106495] *Automated Financial Advisory* must have been started.

V Event excerpt: Computational FinTech with Python and C++ (WS 18/19)

Aim
Implementation of different programming specific concepts and skills.

Content
At the beginning of the semester, each student receives a personalized set of programming tasks .

Workload
Roughly 45 hours.

V Event excerpt: Computational FinTech with Python and C++ (SS 2018)

Aim
Implementation of different programming specific concepts and skills.

Content
At the beginning of the semester, each student receives a personalized set of programming tasks .

Workload
Roughly 45 hours.

T Course: Computational Risk and Asset Management I [T-WIWI-107032]

Responsibility: Maxim Ulrich
Contained in: [M-WIWI-103247] Intelligent Risk and Investment Advisory

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations

No exam in winter semester 2018/2019.

The grade consists of an exam and seven problem sets, which are distributed throughout the semester. All problem sets count equally and make up in total 25% of the final grade. The exam accounts for the remaining 75%. The exam is based on all the material that is taught in the current semester. The exam takes place in the last week of the lecture period. Students who fail the exam are allowed to retake the exam.

Conditions

None.

Recommendations

None

T Course: Computational Risk and Asset Management II [T-WIWI-106494]

Responsibility: Maxim Ulrich
Contained in: [M-WIWI-103247] Intelligent Risk and Investment Advisory

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
No exam in winter term 2018/2019.
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation and 6 problem sets, which are distributed throughout the semester. All problem sets count equally and make up in total 25% of the final grade. The exam accounts for the remaining 75%. The exam is based on all the material that is taught in the current semester. The exam takes place in the last week of the lecture period. Students who fail the exam are allowed to retake the exam.

Conditions
None.

Recommendations
It is recommend that students have studied the material of „Computational Risk and Asset Management I".

Remarks
New course starting winter term 2017/2018.

T Course: Computer-Assisted Analytical Methods for Boundary and Eigenvalue Problems [T-MATH-105854]

Responsibility: Michael Plum
Contained in: [M-MATH-102883] Computer-Assisted Analytical Methods for Boundary and Eigenvalue Problems

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Continuous Time Finance [T-MATH-105930]

Responsibility: Nicole Bäuerle, Vicky Fasen-Hartmann
Contained in: [M-MATH-102860] Continuous Time Finance

ECTS	Language	Exam type	Version
8	deutsch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0159400		Vorlesung (V)	4	Nicole Bäuerle
SS 2018	0159500		Übung (Ü)	2	Nicole Bäuerle

T Course: Control Theory [T-MATH-105909]

Responsibility: Roland Schnaubelt, Lutz Weis
Contained in: [M-MATH-102941] Control Theory

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

Conditions
none

T Course: Convex Analysis [T-WIWI-102856]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101473] Mathematical Programming

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The examination is held in the semester of the lecture and in the following semester.
Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

Conditions

None

Recommendations

It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Remarks

The lecture is offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).

T Course: Convex Geometry [T-MATH-105831]

Responsibility: Daniel Hug
Contained in: [M-MATH-102864] Convex Geometry

ECTS	Language	Exam type	Version
8	englisch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0104400		Vorlesung (V)	4	Daniel Hug
WS 18/19	0104410		Übung (Ü)	2	Daniel Hug

T Course: Corporate Financial Policy [T-WIWI-102622]

Responsibility: Martin Ruckes
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101502] Economic Theory and its Application in Finance
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530214	Corporate Financial Policy	Vorlesung (V)	2	Martin Ruckes
SS 2018	2530215		Übung (Ü)	2	Daniel Hoang, Martin Ruckes

Learning Control / Examinations
The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins.
The exam is offered each semester.

Conditions
None

V Event excerpt: Corporate Financial Policy (SS 2018)

Aim
Students

- are in a position to explain the importance of informational frictions for the financing of firms,
- are able to evaluate financing contracts with respect to their incentive effects,
- are able to analyse financing contracts with respect to their information they provide to outsiders,
- are in a position to derive optimal financing contracts in prototypical situations,
- are able to discuss the financial determinants of corporate distribution policy.

Content
Topics:

- Corporate financing: Some stylized facts
- Financing capacity
- Determination of outside financing
- Liquidity management: Maturity choice
- Cash flows with hidden characteristics
- Cash flows and product markets: Strategic financial structure choice
- Investor activism
- Takeovers

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Elective Literature
Tirole, J. (2006): The Theory of Corporate Finance. Princeton University Press.

T Course: Corporate Risk Management [T-WIWI-109050]

Responsibility: Martin Ruckes
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
3	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2530214	Corporate Risk Management	Vorlesung / Übung (VÜ)	2	Daniel Hoang, Martin Ruckes

Learning Control / Examinations
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. The exam is offered each semester. If there are only a small number of participants registered for the exam, we reserve the right to hold an oral examination instead of a written one.

Conditions
None

Recommendations
None

Remarks
The course is offered as a block course in the winter term.

V Event excerpt: Corporate Risk Management (WS 18/19)

Aim
Students

- are able to explain the importance of risk management for the success of firms,
- are able to identify suitable risk measures for companies,
- can derive measures for the risk reduction of firms
- and are able to develop suitable concepts for the organizational structure of risk management in firms.

Content

- Stochastic basics
- Firm decisions under risk - expected utility theory
- The value motive for corporate risk management
- Common risk measures from practice (e.g. Cash-flow at Risk)
- Operational and financial risk management instruments
- The risk management organization (central vs. decentral)
- External risk reporting (e.g. obligations and incentives)

Workload
The total workload of this course is approximately 90.0 hours. For further information, see German version.

Literature

- Friberg, Richard. *Managing Risk and Uncertainty: A Strategic Approach*. Cambridge, MA: Managing Risk and Uncertainty, 2015.
- Stulz, René M. *Risk Management & Derivatives.* Mason, Ohio: Cengage Learning, Inc, 2002.
- Jorion, Philippe. *Value at Risk, 3rd Ed: The New Benchmark for Managing Financial Risk*. 3 ed. New York: General Finance & Investing, 2006

T Course: Country Manager Simulation [T-WIWI-106137]

Responsibility: Sven Feurer
Contained in: [M-WIWI-101490] Marketing Management

ECTS	Language	Recurrence	Exam type	Version
1.5	englisch	Jedes Wintersemester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2572172	Country Manager Simulation	Block (B)		Sven Feurer

Learning Control / Examinations
Alternative exam assessment (30 minutes presentation) according to § 4 paragraph 2 Nr. 3 of the examination regulation SPO 2015.

Remarks
The course language is English. In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in winter term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in winter term starts.
Please note that only one of the 1.5-ECTS courses can be chosen in this Module.
Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1,5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

V Event excerpt: Country Manager Simulation (WS 18/19)

Aim
Students. . .

- . . . understand what makes marketing and sales special in an international context (role of culture, international buyer behavior, strategic market entry decisions, international marketing mix management)
- . . . are able to analyze relevant country, customer and competitor information and derive a suitable market entry strategy
- . . . understand important concepts of international sales and are able to apply these in the realm of the simulation
- . . . are capable of re-evaluating and adapting their strategy on the basis of changes in the market environment
- . . . are able to critically evaluate the success of the chosen strategy and present the results in front of the class

Content
Understanding Culture
Understanding International Buyer Behavior
Market Entry Decisions
International Marketing and Sales Management (adaptation vs. differentiation)

Workload
Total workload for 1.5 ECTS: ca. 45 hours

Literature
Homburg, Christian (2016), Marketingmanagement, 6. ed., Wiesbaden.

T Course: Credit Risk [T-WIWI-102645]

Responsibility: Marliese Uhrig-Homburg
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2530565	Credit Risk	Vorlesung / Übung (VÜ)	3	Michael Hofmann, Marliese Uhrig-Homburg

Learning Control / Examinations
The assessment consists of a written exam (75 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation and may be supplemented by a non exam assessment according to § 4 paragraph 2 Nr. 3. The examination is offered every semester and can be repeated at every regular examination date.

Conditions
None

Recommendations
See German version.

Remarks
See German version.

V Event excerpt: Credit Risk (WS 18/19)

Aim
The objective of this course is to become familiar with the credit markets and the credit risk indicators like ratings, default probabilities and credit spreads. The students learn about the components of credit risk (e.g. default time and default rate) and quantify these in different theoretical models to price credit derivatives.

Content
The lecture deals with the diverse issues arising in the context of measuring and controlling credit risk. At first, the theoretical and empirical relations between ratings, probabilities of default, and credit spreads are analysed. After that, the focus is on the valuation of credit risk. Finally, the management of credit risk, e.g. using credit derivatives and credit portfolio analysis, is examined, and the legal framework and its implications are discussed

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Lando, D., Credit risk modeling: Theory and Applications, Princeton Univ. Press, (2004).
- Uhrig-Homburg, M., Fremdkapitalkosten, Bonitätsrisiken und optimale Kapitalstruktur, Beiträge zur betriebswirtschaftlichen Forschung 92, Gabler Verlag, (2001).

Elective literature:

- Bluhm, C., Overbeck, L., Wagner, C. , Introduction to Credit Risk Modelling, 2nd Edition, Chapman & Hall, CRC Financial Mathematics Series, (2010).
- Duffie, D., Singleton, K.J., Credit Risk: Pricing, Measurement and Management, Princeton Series of Finance, Prentice Hall, (2003).

T Course: Critical Information Infrastructures [T-WIWI-109248]

Responsibility: Ali Sunyaev
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch/englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2511400		Vorlesung (V)	2	Ali Sunyaev
WS 18/19	2511401		Übung (Ü)	1	Ali Sunyaev

Learning Control / Examinations
The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation.

Conditions
None.

Remarks
New lecture from winter semester 2018/2019.

V Event excerpt: (WS 18/19)

Aim
Students know concepts and technologies relevant for the design and reliable operation of critical information infrastructures and can leverage them to develop solutions for real-world challenges.

Course: Current Issues in the Insurance Industry [T-WIWI-102637]

Responsibility: Wolf-Rüdiger Heilmann
Contained in: [M-WIWI-101469] Insurance Management I

ECTS	Recurrence	Exam type	Version
2	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The exam is offered latest in summer term 2016.
The assessment consists of a written exam (according to Section 4 (2), 1 of the examination regulation) .
The exam takes place every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None

Recommendations
For the understanding of this course knowledge of *Private and Social Insurance* [2530050] is required.

Remarks
Block course. For organizational reasons, please register with the secretay of the chair: thomas.mueller3@kit.edu.

T Course: Data Mining and Applications [T-WIWI-103066]

Responsibility: Rheza Nakhaeizadeh
Contained in: [M-WIWI-101638] Econometrics and Statistics I
[M-WIWI-101639] Econometrics and Statistics II

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2520375		Vorlesung (V)	2/4	Rheza Nakhaeizadeh

Learning Control / Examinations

- Conduction of a larger emprical study in groups
- reporting of milestones
- final presentation (app. 45 minutes)

Conditions

None

V Event excerpt: (SS 2018)

Aim
After completing of the course the students:

- know the definition of Data Mining
- are familiar with the CRISP-DM
- are Familiar with at least six important Data Mining Tasks
- can recognize whether a given problem can be formulated as a data mining problem
- are familiar with the most important Data Mining Algorithms like Decision Tree, K-Means, Artificial Neural Networks, Association Rules, Regression Analysis
- are familiar with evaluation of DM-algorithms
- will be able to use a DM-Tool

Content
Part one: Data Mining
Why Data Mining?

- What is Data Mining?
- History of Data Mining
- Conferences and Journals on Data Mining
- Potential Applications
- Data Mining Process:
- Business Understanding
- Data Understanding
- Data Preparation
- Modeling
- Evaluation
- Deployment
- Interdisciplinary aspects of Data Mining
- Data Mining tasks

- Data Mining Algorithms (Decision Trees, Association Rules,
- Regression, Clustering, Neural Networks)
- Fuzzy Mining
- OLAP and Data Warehouse
- Data Mining Tools
- Trends in Data Mining

Part two: Examples of application of Data Mining

- Success parameters of Data Mining Projects
- Application in industry
- Application in Commerce

Workload
The total workload for this course is approximately 135 hours. For further information see German version.

Literature
U. Fayyad, G. Piatetsky-Shapiro, P. Smyth, R. Uthurusamy, editors, Advances in Knowledge Discovery and Data Mining, AAAI/MIT Press, 1996 (order on-line from Amazon.com or from MIT Press).

- Jiawei Han, Micheline Kamber, Data Mining : Concepts and Techniques, 2nd edition, Morgan Kaufmann, ISBN 1558609016, 2006.
- David J. Hand, Heikki Mannila and Padhraic Smyth, Principles of Data Mining , MIT Press, Fall 2000
- Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Springer Verlag, 2001.
- Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Addison wesley (May, 2005). Hardcover: 769 pages. ISBN: 0321321367
- Ripley, B.D. (1996) Pattern Recognition and Neural Networks, Cambridge: Cambridge University Press.
- Ian witten and Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, 2nd Edition, Morgan Kaufmann, ISBN 0120884070, 2005.

T Course: Database Systems and XML [T-WIWI-102661]

Responsibility: Andreas Oberweis
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2511202	Database Systems and XML	Vorlesung (V)	2	Andreas Oberweis, Gunther Schiefer
WS 18/19	2511203		Übung (Ü)	1	Andreas Fritsch, Andreas Oberweis, Gunther Schiefer

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Conditions
None

V Event excerpt: Database Systems and XML (WS 18/19)

Aim
Students

- know the basics of XML and generate XML documents,
- are able to use XML database systems and to formulate queries to XML documents,
- know to assess the use of XML in operational practice in different application contexts.

Content
Databases are a proven technology for managing large amounts of data. The oldest database model, the hierarchical model, was replaced by different models such as the relational or the object-oriented data model. The hierarchical model became particularly more important with the emergence of the extensible Markup Language XML. XML is a data format for structured, semi-structured, and unstructured data. In order to store XML documents consistently and reliably, databases or extensions of existing data base systems are required. Among other things, this lecture covers the data model of XML, concepts of XML query languages, aspects of storage of XML documents, and XML-oriented database systems.

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam 1h

Total: 150h

Literature

- M. Klettke, H. Meyer: XML & Datenbanken: Konzepte, Sprachen und Systeme. dpunkt.verlag 2003

- H. Schöning: XML und Datenbanken: Konzepte und Systeme. Carl Hanser Verlag 2003
- W. Kazakos, A. Schmidt, P. Tomchyk: Datenbanken und XML. Springer-Verlag 2002
- R. Elmasri, S. B. Navathe: Grundlagen der Datenbanksysteme. 2009
- G. Vossen: Datenbankmodelle, Datenbanksprachen und Datenbankmanagementsysteme. Oldenbourg 2008

Further literature will be given individually.

T Course: Derivatives [T-WIWI-102643]

Responsibility: Marliese Uhrig-Homburg
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101482] Finance 1
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530550	Derivatives	Vorlesung (V)	2	Marliese Uhrig-Homburg
SS 2018	2530551		Übung (Ü)	1	Stefan Fiesel, Marliese Uhrig-Homburg

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

V Event excerpt: Derivatives (SS 2018)

Aim
The objective of the Derivatives lecture is to become familiar with financial markets, especially derivatives markets. Traded securities and frequently used trading strategies will be introduced. Furthermore the pricing of derivatives will be derived and their use in risk management will be discussed.

Content
The lecture deals with the application areas and valuation of financial derivatives. After an overview of the most important derivatives and their relevance, forwards and futures are analysed. Then, an introduction to the Option Pricing Theory follows. The main emphasis is on option valuation in discrete and continuous time models. Finally, construction and usage of derivatives are discussed, e.g. in the context of risk management.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Hull (2012): Options, Futures, & Other Derivatives, Prentice Hall, 8th Edition

Elective literature:
Cox/Rubinstein (1985): Option Markets, Prentice Hall

T Course: Differential Geometry [T-MATH-102275]

Responsibility: Sebastian Grensing, Enrico Leuzinger, Wilderich Tuschmann
Contained in: [M-MATH-101317] Differential Geometry

ECTS	Language	Recurrence	Exam type	Version
8	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0100300	Differential Geometry	Vorlesung (V)	4	Enrico Leuzinger
SS 2018	0100310	Tutorial for 0100300 (Differential Geometry)	Übung (Ü)	2	Enrico Leuzinger

T Course: Digital Health [T-WIWI-109246]

Responsibility: Ali Sunyaev
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
4	deutsch/englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2511402		Vorlesung (V)	2	Ali Sunyaev

Learning Control / Examinations
The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation.

Conditions
None.

Remarks
New lecture from winter semester 2018/2019.

V Event excerpt: (WS 18/19)

Aim
Students are able to: (1) know theoretical foundations of various topics in digital health; (2) know current topics in research on digital health; (3) combine theoretical and practical contents of this lecture.

Workload
4 ECTS = approx. 120 h.

T Course: Digital Transformation of Organizations [T-WIWI-106201]

Responsibility: Alexander Mädche
Contained in: [M-WIWI-104068] Information Systems in Organizations

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2540556		Vorlesung (V)	2	Dominik Augenstein, Alexander Mädche

Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.
Students receive one aggregated grade consisting of a written exam (60%) and case study deliverable (40%). The exam and the case study need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the case study.

Conditions
None

Remarks
The course will be held in English.

V Event excerpt: (SS 2018)

Aim
The students will:

- Get an overview on basic concepts and definitions of information systems and understand key characteristics of IS as a foundation for digitization of business processes, products and services
- Understand important characteristics of software products on which IS are built on
- Learn important concepts and theories in order to successfully execute a digital transformation process

Content

- Definition and key concepts of Information Systems
- Introduction of different types of application systems (organizational process & information-centric systems, customer-centric systems, supplier-centric systems and people-centric systems) and their characteristics
- The digital transformation process: The pre-implementation, implementation and post-implementation phase covering facets such as business/IT alignment, packaged software selection, IS implementation projects, as well as adoption & use of IS
- Practice-oriented case study focusing on real-world IS scenarios

Literature
Daft, R. L. (2009). Organization theory and design. Cengage learning.
Laudon, K. C. and Laudon, J. P. (2014). Management Information Systems: Managing the Digital Firm, 13th Edition, Pearson.
Sambamurthy, V and Zmud, R. Z. (2012). Guiding the Digital Transformation of Organizations. Legerity Digital Press, ISBN 978-0-9857955-0-4.

T Course: Discrete Time Finance [T-MATH-105839]

Responsibility: Nicole Bäuerle, Vicky Fasen-Hartmann
Contained in: [M-MATH-102919] Discrete Time Finance

ECTS	Language	Exam type	Version
8	deutsch	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0108400		Vorlesung (V)	4	Nicole Bäuerle
WS 18/19	0108500		Übung (Ü)	2	Nicole Bäuerle

Conditions
none

T Course: Discrete-Event Simulation in Production and Logistics [T-WIWI-102718]

Responsibility: Stefan Nickel

Contained in: [M-WIWI-102805] Service Operations
[M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550488		Vorlesung (V)	3	Sven Spieckermann

Learning Control / Examinations
The assessment consists of a written paper and an oral exam of about 30-40 min (non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015)).

Conditions
None

Recommendations
Basic knowledge as conveyed in the module "Introduction to Operations Research" is assumed.

Remarks
Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.
The course is planned to be held every summer term.
The planned lectures and courses for the next three years are announced online.

V Event excerpt: (SS 2018)

Aim
The student

- knows basic concepts of discrete event simulation models,
- applies computer-based simulation systems,
- structures and implements simulation studies according to specific process models,
- has an in-depthr knowledge for logistics issues and discovers the importance of statistical methods in modeling and evaluation of simulation models,
- explains coupled systems of simulation and meta-heuristics, and characterizes simulation programs.

Content
Simulation of production and logistics systems is an interdisciplinary subject connecting expert knowledge from production management and operations research with mathematics/statistics as well as computer science and software engineering. With completion of this course, students know statistical foundations of discrete simulation, are able to classify and apply related software applications, and know the relation between simulation and optimization as well as a number of application examples. Furthermore, students are enabled to structure simulation studies and are aware of specific project scheduling issues.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Banks J., Carson II J. S., Nelson B. L., Nicol D. M. (2010) Discrete-event system simulation, 5.Aufl., Pearson, Upper Saddle River.

- Eley, M. (2012): Simulation in der Logistik - Einführung in die Erstellung ereignisdiskreter Modelle unter Verwendung des Werkzeuges "Plant Simulation“, Springer, Berlin und Heidelberg
- Kosturiak, J. und M. Gregor (1995): Simulation von Produktionssystemen. Springer, Wien und New York.
- Law, A. M. (2015): Simulation Modeling and Analysis. 5th Edition, McGraw-Hill, New York usw.
- Liebl, F. (1995): Simulation. 2. Auflage, Oldenbourg, München.
- Noche, B. und S. Wenzel (1991): Marktspiegel Simulationstechnik. In: Produktion und Logistik. TÜV Rheinland, Köln.
- Pidd, M. (2004): Computer Simulation in Management Science. 5th Edition, Wiley, Chichester.
- Robinson S (2004) Simulation: the practice of model development and use. John Wiley & Sons, Chichester
- VDI (2014): Simulation von Logistik-, Materialfluß- und Produktionssystemen. VDI Richtlinie 3633, Blatt 1, VDI-Verlag, Düsseldorf.

T Course: Dispersive equations [T-MATH-109001]

Responsibility: Wolfgang Reichel
Contained in: [M-MATH-104425] Dispersive equations

ECTS	Recurrence	Exam type	Version
6	Unregelmäßig	Prüfungsleistung schriftlich	1

Conditions
none

T Course: Dynamic Macroeconomics [T-WIWI-109194]

Responsibility: Johannes Brumm
Contained in: [M-WIWI-101478] Innovation and Growth
[M-WIWI-101496] Growth and Agglomeration

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2560402	Dynamic Macroeconomics	Vorlesung (V)	2	Johannes Brumm
WS 18/19	2560403	Übung zu Dynamic Macroeconomics	Übung (Ü)	1	Christopher Krause

Learning Control / Examinations
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Conditions
None.

V Event excerpt: Dynamic Macroeconomics (WS 18/19)

Aim
Students

- gain insight into state-of-the-art macroeconomic theory
- are acquainted with workhorse models of dynamic economic modeling
- are prepared to apply algorithms and numerical methods to studying (macro)economic problems
- practice coding skills and learn basic principles of scientific computing

Workload
The total workload for this course is approximately 135 hours. For further information see German version.

Literature
Literature and lecture notes are provided during the course.

T Course: Dynamical Systems [T-MATH-106114]

Responsibility: Jens Rottmann-Matthes
Contained in: [M-MATH-103080] Dynamical Systems

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung mündlich	1

Conditions
none

T Course: Efficient Algorithms [T-WIWI-102655]

Responsibility: Pradyumn Kumar Shukla
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Einmalig	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511100	Efficient Algorithms	Vorlesung (V)	2	Pradyumn Kumar Shukla
SS 2018	2511101		Übung (Ü)	1	Pradyumn Kumar Shukla

Learning Control / Examinations
The examination will be offered only in summer term 2018.
The assessment consists of assignments or of a bonus exam (wrt §4 (2), 3 SPO), and a written exam (60 min.) in the week after the end of the lecturing periodwrt (§4 (2), 1 SPO).
If the mark obtained in the written exam is in between 1.3 and 4.0, a successful completion of the assignments or the bonus exam will improve the mark by one level (i.e. by 0.3 or 0.4).
Deviations from this type of assessment are announced at the beginning of this course.

Conditions
None

V Event excerpt: Efficient Algorithms (SS 2018)

Aim
The student will learn how to use methods and concepts of efficient algorithms and how to demonstrate adequate innovative capabilities with respect to the used methods.
This course emphasizes the teaching of advanced concepts for the design and application of algorithms, data structures, and computer infrastructures in relation to their applicability in the real world. Based on a fundamental understanding of the covered concepts and methods, students should know how to select appropriate concepts and methods for problem settings in their professional life, and, if necessary, to extend and apply them in an adequate form. The students should be enabled to find adequate arguments for justifying their chosen problem solutions.

Content
In a problem oriented way the course presents systematic approaches to the design and analysis of efficient algorithms using standard tasks of information processing as generic examples. Special emphasis is put on the influence of data structures and computer architectures on the performance and cost of algorithms.In particular, the course emphasizes the design and analysis of algorithms on parallel computers and in hardware, which is increasingly important considering the growing presence of multicore architectures.

Workload
The total workload for this course is approximately 150.0 hours. For further information see German version.

Literature
Akl, S.G.: The Design and Analysis of Parallel Algorithms. Prentice-Hall, Englewood Cliffs, New Jersey,1989.
Borodin, Munro: The Computational Complexity of Algebraic and Numeric Problems (Elsevier 1975)
Cormen, Leiserson, Rivest: Introduction to Algorithms (MIT Press)
Sedgewick: Algorithms (Addison-Wesley) (many different versions available)
Elective literature:
will be announced in class

T Course: Efficient Energy Systems and Electric Mobility [T-WIWI-102793]

Responsibility: Patrick Jochem, Russell McKenna
Contained in: [M-WIWI-101452] Energy Economics and Technology

ECTS	Language	Recurrence	Exam type	Version
3.5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2581006	Efficient Energy Systems and Electric Mobility	Vorlesung (V)	2	Patrick Jochem, Russell McKenna

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

V Event excerpt: Efficient Energy Systems and Electric Mobility (SS 2018)

Aim

- Understand the concept of energy efficiency as applied to specific systems
- Obtain an overview of the current trends in energy efficiency
- Be able to determine and evaluate alternative methods of energy efficiency improvement
- Overview of technical and economical stylized facts on electric mobility
- Judging economical, ecological and social impacts through electric mobility

Content
This lecture series combines two of the most central topics in the field of energy economics at present, namely energy efficiency and electric mobility. The objective of the lecture is to provide an introduction and overview to these two subject areas, including theoretical as well as practical aspects, such as the technologies, political framework conditions and broader implications of these for national and international energy systems.
The energy efficiency part of the lecture provides an introduction to the concept of energy efficiency, the means of affecting it and the relevant framework conditions. Further insights into economy-wide measurements of energy efficiency, and associated difficulties, are given with recourse to several practical examples. The problems associated with market failures in this area are also highlighted, including the Rebound Effect. Finally and by way of an outlook, perspectives for energy efficiency in diverse economic sectors are examined.
The electric mobility part of the lecture examines all relevant issues associated with an increased penetration of electric vehicles including their technology, their impact on the electricity system (power plants and grid), their environmental impact as well as their optimal integration in the future private electricity demand (i.e. smart grids and V2G). Besides technical aspects the user acceptance and behavioral aspects are also discussed.

Workload
The total workload for this course is approximately 105.0 hours. For further information see German version.

Literature
Will be anounced in the lecture.

T Course: eFinance: Information Engineering and Management for Securities Trading [T-WIWI-102600]

Responsibility: Christof Weinhardt
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2540454	eFinance: Information Engineering and Management for Securities Trading	Vorlesung (V)	2	Florian Glaser, Benedikt Notheisen, Christof Weinhardt
WS 18/19	2540455		Übung (Ü)	1	Florian Glaser, Benedikt Notheisen

Learning Control / Examinations
The assessment consists of a written exam (60 min) (§4(2), 1 of the examination regulations) and by submitting written essays as part of the exercise (§4(2), 3 SPO 2007 respectively §4(3) SPO 2015). 70% of the final grade is based on the written exam and 30% is based on assignments from the exercises. The points obtained in the exercises only apply to the first and second exam of the semester in which they were obtained.

Conditions
None

Recommendations
None

V Event excerpt: eFinance: Information Engineering and Management for Securities Trading (WS 18/19)

Aim
The students

- are able to understand the theoretical and pracitical aspects of securitites trading,
- are able to handle the relevant electronic tools for the evaluation of financial data,
- are able to identify the incentives of the traders for participation in different market plattforms,
- are able to analyse capital marketplaces concerning their efficiency, weaknesses and technical configuration,
- are able to apply theoretical methods of econometrics,
- are able to understand, criticize and present articles with a finance-scientific background,
- learn to elaborate solutions in a team.

Content
The theoretical part of the course examines the New Institutions Economics which provides a theoretically found explanation for the existence of markets and intermediaries. Building upon the foundations of the market micro structure, several key parameters and factors of electronic trading are examined. These insights gained along a structured securities trading process are complemented and verified by the analysis of prototypical trading systems developed at the institute as well as selected trading systems used by leading exchanges in the world. In the more practical-oriented second part of the lecture, speakers from practice will give talks about financial trading systems and link the theoretical findings to real-world systems and applications.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Picot, Arnold, Christine Bortenlänger, Heiner Röhrl (1996): "Börsen im Wandel". Knapp, Frankfurt
- Harris, Larry (2003): "Trading and Exchanges - Market Microstructure for Practitioners"". Oxford University Press, New York

Elective literature:

- Gomber, Peter (2000): "Elektronische Handelssysteme - Innovative Konzepte und Technologien". Physika Verlag, Heidelberg
- Schwartz, Robert A., Reto Francioni (2004): "Equity Markets in Action - The Fundamentals of Liquidity, Market Structure and Trading". Wiley, Hoboken, NJ

T Course: Emerging Trends in Criticial Information Infrastructures [T-WIWI-109250]

Responsibility: Ali Sunyaev
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
4	Jedes Semester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2513400		Seminar (S)	2	Sebastian Lins, Ali Sunyaev, Scott Thiebes

Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of a final thesis.

Conditions
None.

Remarks
The course is usually held as a block course.

V Event excerpt: (WS 18/19)

Aim
Students (1) independently analyze current questions in the field of information systems; (2) work on the respective scientific question with recognized scientific methods and write a seminar thesis on it; (3) can combine already learned theoretical and practical lecture contents of the respective question.

T Course: Energy and Environment [T-WIWI-102650]

Responsibility: Ute Karl
Contained in: [M-WIWI-101452] Energy Economics and Technology

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2581003	Energy and Environment	Vorlesung (V)	2	Ute Karl
SS 2018	2581004		Übung (Ü)	1	Katrin Seddig

Learning Control / Examinations
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Conditions
None.

V Event excerpt: Energy and Environment (SS 2018)

Aim
The student should identify environmental problems of energy from fossil fuels. The student can identify appropriate technologies for pollution control. The student knows methods for assessing environmental problems and their ways of application.

Content
The focus of the lecture is put on environmental impacts of fossil fuel conversion and related assessment methods. The list of topics is given below.

- Fundamentals of energy conversion
- Air pollutant formation from fossil fuel combustion
- Control of air pollutant emissions from fossil-fuelled power plants.
- Measures to improve conversion efficiency of fossil fuelled power plants.
- External effects of energy supply (Life Cycle Assessment of selected energy systems)
- Integrated Assessment models supporting the European Thematic Strategy on Air
- Cost-effectiveness analyses and cost-benefit analyses of air pollution control measures
- Monetary evaluation of external effects of energy supply (external costs)

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Thr references for further reading are included in the lecture documents (see ILIAS)

T Course: Energy Market Engineering [T-WIWI-107501]

Responsibility: Christof Weinhardt
Contained in: [M-WIWI-103720] eEnergy: Markets, Services and Systems

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2540464	Energy Market Engineering	Vorlesung (V)	2	Philipp Staudt, Christof Weinhardt
SS 2018	2540465		Übung (Ü)	1	Esther Marie Mengelkamp, Philipp Staudt

Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Conditions
None

Recommendations
None

Remarks
Former course title until summer term 2017: T-WIWI-102794 "eEnergy: Markets, Services, Systems".
The lecture has also been added in the IIP Module *Basics of Liberalised Energy Markets*.

V Event excerpt: Energy Market Engineering (SS 2018)

Aim
The student

- know the scientifically discussed design options for energy markets.
- can evaluate and discuss advantages and disadvantages of different energy market design options.
- can jusge which design is ideal in which environment.
- is able to understand and employscientific methods to evaluate energy market designs

Content
This lecture discusses different design options for electricity markets. We will focus on different approaches of nodal and zonal pricing as well as single price mechanisms and capacity markets. After a short recap of German and European market designs, the different design options will be discussed scientifically and with the help of examples. Furthermore, we will evaluate alternative market design options like microgrids. Besides the fundamental functioning of those markets, we will introduce and discuss methodological knowledge to evaluate market design options.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Erdmann G, Zweifel P. *Energieökonomik, Theorie und Anwendungen*. Berlin Heidelberg: Springer; 2007.
- Grimm V, Ockenfels A, Zoettl G. Strommarktdesign: Zur Ausgestaltung der Auktionsregeln an der EEX *. *Zeitschrift für Energiewirtschaft*. 2008:147-161.
- Stoft S. *Power System Economics: Designing Markets for Electricity*. IEEE; 2002.,

- Ströbele W, Pfaffenberger W, Heuterkes M. *Energiewirtschaft: Einführung in Theorie und Politik*. 2nd ed. München: Oldenbourg Verlag; 2010:349.

T Course: Energy Networks and Regulation [T-WIWI-107503]

Responsibility: Christof Weinhardt
Contained in: [M-WIWI-103720] eEnergy: Markets, Services and Systems

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2540494	Energy Networks and Regulation	Vorlesung (V)	2	Stefan Rogat
WS 18/19	2540495		Übung (Ü)	1	Stefan Rogat

Learning Control / Examinations
The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation.
The exam is offered every semester. Re-examinations are offered on every ordinary examination date.

Conditions
None

Recommendations
None

Remarks
Former course title until summer term 2017: T-WIWI-103131 “Regulatory Management and Grid Management - Economic Efficiency of Network Operation”

V Event excerpt: Energy Networks and Regulation (WS 18/19)

Aim
The student,

- understands the business model of a network operator and knows its central tasks in the energy supply system,
- provides a holistic overview of the interrelationships in the network economy,
- understands the regulatory and business interactions,
- is particularly familiar with the current model of incentive regulation with its essential components and understands its implications for the decisions of a network operator
- is able to analyse and assess controversial issues from the perspective of different stakeholders.

Content
The lecture “Energy Networks and Regulation” provides insights into the regulatory framework of electricity and gas. It touches upon the way the grids are operated and how regulation affects almost all grid activities. The lecture also addresses approaches of grid companies to cope with regulation on a managerial level. We analyze how the system influences managerial decisions and strategies such as investment or maintenance. Furthermore, we discuss how the system affects the operator’s abilities to deal with the massive challenges lying ahead (“Energiewende”, redispatch, European grid integration, electric vehicles etc.). Finally, we look at current developments and major upcoming challenges, e.g., the smart meter rollout. Covered topics include:

- Grid operation as a heterogeneous landscape: big vs. small, urban vs. rural, TSO vs. DSO.
- Objectives of regulation: Fair price calculation and high standard access conditions.
- The functioning of incentive regulation
- Amendment to the incentive regulation: its merits, its flaws
- The revenue cap and how it is adjusted according to certain exogenous factors
- Grid tariffs: How are they calculated, what is the underlying rationale, do we need a reform (and which)?
- Exogenous costs shifted (arbitrarily) into the grid, e.g. feed-in tariffs for renewable energy or decentralized supply.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

Averch, H.; Johnson, L.L (1962). Behavior of the firm under regulatory constraint, in: American Economic Review, 52 (5), S. 1052 – 1069.
Bundesnetzagentur (2006): Bericht der Bundesnetzagentur nach § 112a EnWG zur Einführung der Anreizregulierung nach § 21a EnWG, http://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Energie/Unternehmen_Institutionen/Netzentgelte/Anreizregulierung/BerichtEinfuehrgAnreizregulierung.pdf?__blob=publicationFile&v=3.
Bundesnetzagentur (2015): Evaluierungsbericht nach § 33 Anreizregulierungsverordnung, https://www.bmwi.de/Redaktion/DE/Downloads/A/anreizregulierungsverordnung-evaluierungsbericht.pdf?__blob=publicationFile&v=1.
Filippini, M.; Wild, J.; Luchsinger, C. (2001) : Regulierung der Verteilnetzpreise zu Beginn der Marktöffnung. Erfahrungen in Norwegen und Schweden, Bundesamt für Energie, Bern, http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/34/066/34066585.pdf.
Gómez, T. (2013): Monopoly Regulation, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 151 – 198, Springer-Verlag, London.
Gómez, T. (2013): Electricity Distribution, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 199 – 250, Springer- Verlag, London.
Pérez-Arriaga, I.J. (2013): Challenges in Power Sector Regulation, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 647 – 678, Springer-Verlag, London.
Rivier, M.; Pérez-Arriaga, I.J.; Olmos, L. (2013): Electricity Transmission, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 251 – 340, Springer-Verlag, London.

T Course: Energy Systems Analysis [T-WIWI-102830]

Responsibility: Valentin Bertsch
Contained in: [M-WIWI-101452] Energy Economics and Technology

ECTS	Language	Recurrence	Exam type	Version
3	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2581002	Energy Systems Analysis	Vorlesung (V)	2	Armin Ardone

Learning Control / Examinations
The assessment consists of a written exam according to Section 4(2), 1 of the examination regulation.

Conditions
None

Recommendations
None

Remarks
Since 2011 the lecture is offered in winter term. Exams can still be taken in summer term.

V Event excerpt: Energy Systems Analysis (WS 18/19)

Aim
The student
- has the ability to understand and critically reflect the methods of energy system analysis, the possibilities of its application in the energy industry and the limits and weaknesses of this approach
- can use select methods of the energy system analysis by her-/himself

Content
1. Overview and classification of energy systems modelling approaches
2. Usage of scenario techniques for energy systems analysis
3. Unit commitment of power plants
4. Interdependencies in energy economics
5. Scenario-based decision making in the energy sector
6. Visualisation and GIS techniques for decision support in the energy sector

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Weiterführende Literatur:

- Möst, D. und Fichtner, W.: **Einführung zur Energiesystemanalyse**, in: Möst, D., Fichtner, W. und Grunwald, A. (Hrsg.): Energiesystemanalyse, Universitätsverlag Karlsruhe, 2009
- Möst, D.; Fichtner, W.; Grunwald, A. (Hrsg.): **Energiesystemanalyse** - Tagungsband des Workshops "Energiesystemanalyse" vom 27. November 2008 am KIT Zentrum Energie, Karlsruhe, Universitätsverlag Karlsruhe, 2009 [PDF: http://digbib.ubka.uni-karlsruhe.de/volltexte/documents/928852]

T Course: Engineering FinTech Solutions [T-WIWI-106193]

Responsibility: Maxim Ulrich
Contained in: [M-WIWI-103247] Intelligent Risk and Investment Advisory
[M-WIWI-103261] Disruptive FinTech Innovations

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Sommersemester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530357	Engineering FinTech Solutions	Vorlesung (V)	2	Maxim Ulrich
WS 18/19	2530357	Engineering FinTech Solutions	Vorlesung (V)	2	Maxim Ulrich

Learning Control / Examinations
The grade consists of a written part and an oral exam. In the written part, students solve an academic problem from the field of risk and asset management. This part counts for 30% of the grade. An oral exam at the end of the semester accounts for 70% of the final grade and gives the student a chance to present and defend his solution.

Conditions
There are two conditions for taking this course:

1. This course is only open for registered students of the module "Intelligent Risk and Investment Advisory" and "Disruptive FinTech Solutions".
2. Registered students have completed a Bachelor thesis with a grade of 1.3 or better on a topic that has had a significant exposure to IT- or software engineering content. Alternatively, students who completed at least one of the following lectures with a grade of 1.7 or better are also eligible to participate: Computational Risk and Asset Management, Bayesian Risk Analytics and Machine Learning.

Recommendations
None

Remarks
New course starting summer term 2017.

V Event excerpt: Engineering FinTech Solutions (WS 18/19)

Aim
Students develop modern IT-technologies to solve financial problems.

Content
This project-oriented lecture invites students to work independently and yet, under close monitoring of researchers and the professor of the C-RAM research group, on a sub-problem of a larger FinTech research question. Students will in a personalized manner be introduced to the necessary concepts, tools and methods that are necessary to solve the question at hand. Students obtain the opportunity to connect newest research insights with modern information technology to move a step closer towards their own development of a prototype. Depending on the topic, students work alone or in groups. An essential part of the guided research mentoring is that students take part in weekly meetings to discuss open issues, to present their progress and to learn from their fellow students

Workload
The total workload for this course is approximately 135 hours. For further information see German version.

Literature
Literature will be distributed during the first lecture.

T Course: Enterprise Architecture Management [T-WIWI-102668]

Responsibility: Thomas Wolf
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2511600	Enterprise Architecture Management	Vorlesung (V)	2	Thomas Wolf
WS 18/19	2511601		Übung (Ü)	1	Thomas Wolf

Learning Control / Examinations
The assessment of this course is a written (60 min.) or (if necessary) oral examination (30 min.) according to §4(2) of the examination regulation.

Conditions
None

V Event excerpt: Enterprise Architecture Management (WS 18/19)

Aim
Students understand the connection between enterprise strategy, business processes and business objects and IT architecture; they know methods to depict these connections and how they can be developed based on each other.

Content
The following topics will be covered: components of enterprise architecture, enterprise strategy including methods to develop strategies, business process (re)engineering, methods to implement changes within enterprises (management of change)

Literature

- Nolan, R., Croson, D.: Creative Destruction: A Six-Stage Process for Transforming the Organization. Harvard Business School Press, Boston Mass. 1995
- Doppler, K., Lauterburg, Ch.: Change Management. Campus Verlag 1997
- Jacobson, I.: The Object Advantage, Business Process Reengineering with Object Technology. Addison-Wesley Publishing Company, Wokingham England 1994
- Keller, G., Teufel, Th.: SAP R/3 prozessorientiert anwenden. Addison Wesley 1998
- Österle, H.: Business Engineering Bd. 1 und 2. Springer Verlag, Berlin 1995

T Course: Evolution Equations [T-MATH-105844]

Responsibility: Roland Schnaubelt, Lutz Weis
Contained in: [M-MATH-102872] Evolution Equations

ECTS	Language	Exam type	Version
8	deutsch/englisch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0105900		Vorlesung (V)	4	Roland Schnaubelt
WS 18/19	0105910		Übung (Ü)	2	Roland Schnaubelt

V Event excerpt: (WS 18/19)

Literature

Auf meiner [http://www.math.kit.edu/iana3/~schnaubelt/|Homepage] findet man die PDF Datei des (englischen) Skriptums meiner Vorlesung Evolution Equations aus dem Wintersemester 2010/11. Eine aktualisierte Fassung wird im Frühjahr 2019 erstellt werden.
* Engel, Nagel: One-Parameter Semigroups for Linear Evolution Equations
Pazy: Semigroups of Linear Operators and Applications to Partial Differential Equations
* Arendt, Batty, Hieber, Neubrander: Vector-valued Laplace Transforms and Cauchy Problems
Davies: One-Parameter Semigroups
Engel, Nagel: A Short Course of Operator Semigroups
Fattorini: The Cauchy Problem
Goldstein: Semigroups of Linear Operators and Applications
Hille, Phillips: Functional Analysis and Semi-groups
Lunardi: Analytic Semigroups and Optimal Regularity in Parabolic Problems
Tanabe: Equations of Evolution

T Course: Exchanges [T-WIWI-102625]

Responsibility: Jörg Franke
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
1.5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530296	Exchanges	Vorlesung (V)	1	Jörg Franke

Learning Control / Examinations
The examination will be offered latest until winter term 2018/2019 (repeaters only).

Conditions
None

Recommendations
None

V Event excerpt: Exchanges (SS 2018)

Aim
Students are in a position to discuss and evaluate current developments regarding the organisation of exchanges and securities trading.

Content

- Organisation of exchanges: Changing Zeitgeist - Corporates instead of cooparative structures
- Market models: order driven vs. market maker - Liquidity provision for less frequently traded securities
- Trading systems: The end of an era? - No more need for running traders?
- Clearing: Diversity instead of uniformity - Safety for all?
- Settlement: Increasing importance - Does efficient settlement assure the "value added" of exchanges in the long run?

Workload
The total workload for this course is approximately 45.0 hours. For further information see German version.

Literature
Elective literature:
Educational material will be offered within the lecture.

T Course: Experimental Economics [T-WIWI-102614]

Responsibility: Jella Pfeiffer, Christof Weinhardt
Contained in: [M-WIWI-102970] Decision and Game Theory
[M-WIWI-101505] Experimental Economics

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2540489	Experimental Economics	Vorlesung (V)	2	Verena Dorner, Michael Knierim, Christian Peukert, Jella Pfeiffer
WS 18/19	2540493		Übung (Ü)	1	Michael Knierim

Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Conditions
None

V Event excerpt: Experimental Economics (WS 18/19)

Aim
The students should learn

- how to gain scientific experience and knowledge (philosophy of science),
- how Game Theory and Experimental Economics influenced each other in scientific research,
- about the methods as well as the strengths and weaknesses of Experimental Economics,
- some examples of experimental research, such as markets and auctions, coordination games, bargaining, decision making under risk,
- how to evaluate data.

Content
Experimental Economics have become a separate field in Economics. Nearly all fields of the economic discipline use economic experiments to verify theoretical results. Besides being used for empricial validation, this method is applied in political and strategic consulting. The lecture gives an introduction to experimental methods in economics and shows differences to experiments in natural sciences. Scientific studies are used to show exemplary applications.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Strategische Spiele; S. Berninghaus, K.-M. Ehrhart, W. Güth; Springer Verlag, 2nd ed., 2006.
- Handbook of Experimental Economics; J. Kagel, A. Roth; Princeton University Press, 1995.
- Experiments in Economics; J.D. Hey; Blackwell Publishers, 1991.
- Experimental Economics; D.D. Davis, C.A. Holt; Princeton University Press, 1993.
- Experimental Methods: A Primer for Economists; D. Friedman, S. Sunder; Cambridge University Press, 1994.

T Course: Exponential Integrators [T-MATH-107475]

Responsibility: Marlis Hochbruck
Contained in: [M-MATH-103700] Exponential Integrators

ECTS	Recurrence	Exam type	Version
6	Unregelmäßig	Prüfungsleistung mündlich	1

Conditions
none

T Course: Extremal Graph Theory [T-MATH-105931]

Responsibility: Maria Aksenovich
Contained in: [M-MATH-102957] Extremal Graph Theory

ECTS	Recurrence	Exam type	Version
8	Jedes Semester	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0150400		Vorlesung (V)	4	Maria Aksenovich, Yelena Yuditsky
SS 2018	0150410		Übung (Ü)	2	Maria Aksenovich, Yelena Yuditsky

T Course: Extreme Value Theory [T-MATH-105908]

Responsibility: Vicky Fasen-Hartmann, Norbert Henze
Contained in: [M-MATH-102939] Extreme Value Theory

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0155600		Vorlesung (V)	2	Vicky Fasen-Hartmann
SS 2018	0155610		Übung (Ü)	1	Vicky Fasen-Hartmann

T Course: Facility Location and Strategic Supply Chain Management [T-WIWI-102704]

Responsibility: Stefan Nickel

Contained in: [M-WIWI-101413] Applications of Operations Research
[M-WIWI-101414] Methodical Foundations of OR
[M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2550486	Facility Location and Strategic Supply Chain Management	Vorlesung (V)	2	Stefan Nickel
WS 18/19	2550487		Übung (Ü)	1	Hannah Bakker

Learning Control / Examinations
The assessment consists of a written exam (120 min) according to Section 4 (2), 1 of the examination regulation.
The exam takes place in every semester.
Prerequisite for admission to examination is the succesful completion of the online assessments.

Conditions
Prerequisite for admission to examination is the succesful completion of the online assessments.

Recommendations
None

Remarks
The lecture is held in every winter term. The planned lectures and courses for the next three years are announced online.

V Event excerpt: Facility Location and Strategic Supply Chain Management (WS 18/19)

Aim
The student

- knows and describes basic quantitative methods in location planning in the context of strategic Supply Chain Planning,
- applies several criteria for the evaluation of the locations of facilities in the context of classical location planning models (planar models, network models and discrete models) and advanced location planning models designed for Supply Chain Management (single-period and multi-period models),
- implements the considered models in practical problems.

Content
Since the classical work "Theory of the Location of Industries" of Weber from 1909, the determination of an optimal location of a new facility with respect to existing customers is strongly connected to strategical logistics planning. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning allows an efficient flow of materials and leads to lower costs and increased customer service.
Subject of the course is an introduction to the most important terms and definitions in location planning as well as the presentation of basic quantitative location planning models. Furthermore, specialized location planning models for Supply Chain Management will be addressed as they are part in many commercial SCM tools for strategic planning tasks.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Elective literature:

- Daskin: Network and Discrete Location: Models, Algorithms, and Applications, Wiley, 1995
- Domschke, Drexl: Logistik: Standorte, 4. Auflage, Oldenbourg, 1996
- Francis, McGinnis, White: Facility Layout and Location: An Analytical Approach, 2nd Edition, Prentice Hall, 1992
- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988
- Thonemann: Operations Management - Konzepte, Methoden und Anwendungen, Pearson Studium, 2005

T Course: Financial Analysis [T-WIWI-102900]

Responsibility: Torsten Luedecke
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch/englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530205		Vorlesung (V)	2	Torsten Luedecke
SS 2018	2530206		Übung (Ü)	2	Torsten Luedecke

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
Basic knowledge in corporate finance, accounting, and valuation is required.

V Event excerpt: (SS 2018)

Aim
Students are able to

- understand the key financial statements according to international standards,
- use financial ratios and financial analysis for different purposes,
- evaluate the financial performance of the firm,
- determine the value of the firm by using residual income and cash flow figures, respectively,
- assess the quality of financial statements.

Content
Topics:

- Introduction to Financial Analysis
- Financial Reporting Standards
- Major Financial Statements and Other Information
- Recognition and Measurement Issues
- Analysis of Financial Statements
- Financial Reporting Quality

Literature

- Alexander, D. and C. Nobes (2017): Financial Accounting – An International Introduction, 6th ed., Pearson.
- Penman, S.H. (2013): Financial Statement Analysis and Security Valuation, 5th ed., McGraw Hill.

T Course: Financial Econometrics [T-WIWI-103064]

Responsibility: Melanie Schienle
Contained in: [M-WIWI-101638] Econometrics and Statistics I
[M-WIWI-101639] Econometrics and Statistics II

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2520022		Vorlesung (V)	2	Melanie Schienle
SS 2018	2520023		Übung (Ü)	2	Chong Liang, Melanie Schienle

Learning Control / Examinations
The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Modeled Conditions
The following conditions must be met:

- The course [T-MATH-105874] *Time Series Analysis* must not have been started.

Recommendations
Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics"[2520016]

Remarks
The course takes place each second summer term: 2018/2020. . . .

V Event excerpt: (SS 2018)

Aim
The student

- shows a broad knowledge of fincancial econometric estimation and testing techniques
- is able to apply his/her technical knowledge using software in order to critically assess empirical problems

Content
ARMA, ARIMA, ARFIMA, (non)stationarity, causality, cointegration, ARCH/GARCH, stochastic volatility models, computer based exercises

Workload
The total workload for this course is approximately 135 hours (4.5 credits).
regular attendance: 30 hours
self-study: 65 hours
exam preparation: 40 hours

T Course: Financial Intermediation [T-WIWI-102623]

Responsibility: Martin Ruckes
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101502] Economic Theory and its Application in Finance
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2530232	Financial Intermediation	Vorlesung (V)	2	Martin Ruckes
WS 18/19	2530233		Übung (Ü)	1	Andreas Benz, Daniel Hoang, Martin Ruckes

Learning Control / Examinations
The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins.
The exam is offered each semester.

Conditions
None

Recommendations
None

V Event excerpt: Financial Intermediation (WS 18/19)

Aim
Students

- are in a position to describe the arguments for the existence of financial intermediaries,
- are able of discuss and analyze both static and dynamic aspects of contractual relationships between banks and borrowers,
- are able to discuss the macroeconomic role of the banking system,
- are in a position to explain the fundamental principles of the prudential regulation of banks and are able to recognize and evaluate the implications of specific regulations.

Content

- Arguments for the existence of financial intermediaries
- Bank loan analysis, relationship lending
- Stability of the financial system
- The macroeconomic role of financial intermediation
- Principles of the prudential regulation of banks

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Elective literature:

- Hartmann-Wendels/Pfingsten/Weber (2014): Bankbetriebslehre, 6th edition, Springer Verlag.
- Freixas/Rochet (2008): Microeconomics of Banking, 2nd edition, MIT Press.

T Course: Finite Element Methods [T-MATH-105857]

Responsibility: Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners
Contained in: [M-MATH-102891] Finite Element Methods

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0110300		Vorlesung (V)	4	Andreas Rieder
WS 18/19	0110310		Übung (Ü)	2	Andreas Rieder

T Course: Finite group schemes [T-MATH-106486]

Responsibility: Fabian Januszewski
Contained in: [M-MATH-103258] Finite group schemes

ECTS	Recurrence	Exam type	Version
4	Einmalig	Prüfungsleistung mündlich	1

T Course: Fixed Income Securities [T-WIWI-102644]

Responsibility: Marliese Uhrig-Homburg
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
Please note that the lecture is not held in winter semester 18/19.
The assessment consists of a written exam (75 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation SPO2015 and may be supplemented by a non exam assessment according to § 4 paragraph 2 Nr. 3.The examination is offered every semester and can be repeated at every regular examination date.

Conditions
None

Recommendations
Knowledge from the course "Derivatives" is very helpful.

Remarks
See German version.

T Course: Forecasting: Theory and Practice [T-MATH-105928]

Responsibility: Tilmann Gneiting
Contained in: [M-MATH-102956] Forecasting: Theory and Practice

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0123100		Vorlesung (V)	2	Tilmann Gneiting
WS 18/19	0123110		Übung (Ü)	2	Tilmann Gneiting

T Course: Foundations of continuum mechanics [T-MATH-107044]

Responsibility: Christian Wieners
Contained in: [M-MATH-103527] Foundations of continuum mechanics

ECTS	Recurrence	Exam type	Version
3	Einmalig	Prüfungsleistung mündlich	1

Conditions
none

T Course: Fourier Analysis [T-MATH-105845]

Responsibility: Roland Schnaubelt, Lutz Weis
Contained in: [M-MATH-102873] Fourier Analysis

ECTS	Exam type	Version
8	Prüfungsleistung schriftlich	1

T Course: Functional Analysis [T-MATH-102255]

Responsibility: Gerd Herzog, Dirk Hundertmark, Tobias Lamm, Michael Plum, Wolfgang Reichel, Christoph Schmoeger, Roland Schnaubelt, Lutz Weis
Contained in: [M-MATH-101320] Functional Analysis

ECTS	Language	Recurrence	Exam type	Version
8	englisch	Jedes Wintersemester	Prüfungsleistung mündlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0104800		Vorlesung (V)	4	Peer Kunstmann
WS 18/19	0104810		Übung (Ü)	2	Peer Kunstmann

V Event excerpt: (WS 18/19)

Literature
Auf der Webseite von Prof Schnaubelt findet man Vorlesungsskripte vergangener Vorlesungen in Funktionalanalysis. Diese wreden sukszessive aktualisiert und dann auf dieser Webseite und im Ilias zur Verfügung gestellt. Weitere Literatur

- D. Werner: Funktionalanalysis.

- H.W. Alt: Lineare Funktionalanalysis
- H. Brezis: Functional Analysis, Sobolev Spaces and Partial Differential Equations.
- J.B. Conway: A Course in Functional Analysis.
- M. Haase: Functional Analysis: An Elementary Introduction.
- M. Reed, B. Simon: Functional Analysis.
- W. Rudin: Functional Analysis.
- M. Schechter: Principles of Functional Analysis.
- E. Stein, R. Shakarachi: Functional Analysis.
- A.E. Taylor, D.C. Lay: Introduction to Functional Analysis.
- K. Yosida: Functional Analysis.

T Course: Functions of Matrices [T-MATH-105906]

Responsibility: Volker Grimm
Contained in: [M-MATH-102937] Functions of Matrices

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Conditions
none

T Course: Functions of Operators [T-MATH-105905]

Responsibility:
Contained in: [M-MATH-102936] Functions of Operators

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

T Course: Generalized Regression Models [T-MATH-105870]

Responsibility: Norbert Henze, Bernhard Klar
Contained in: [M-MATH-102906] Generalized Regression Models

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0161400		Vorlesung (V)	2	Bernhard Klar
SS 2018	0161410		Übung (Ü)	1	Bernhard Klar

T Course: Geometric Group Theory [T-MATH-105842]

Responsibility: Frank Herrlich, Enrico Leuzinger, Gabriele Link, Roman Sauer, Petra Schwer, Wilderich Tuschmann

Contained in: [M-MATH-102867] Geometric Group Theory

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung schriftlich	1

T Course: Geometric Numerical Integration [T-MATH-105919]

Responsibility: Marlis Hochbruck, Tobias Jahnke
Contained in: [M-MATH-102921] Geometric Numerical Integration

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

Conditions
none

T Course: Geometry of Schemes [T-MATH-105841]

Responsibility: Frank Herrlich, Stefan Kühnlein
Contained in: [M-MATH-102866] Geometry of Schemes

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Global Differential Geometry [T-MATH-105885]

Responsibility: Sebastian Grensing, Wilderich Tuschmann
Contained in: [M-MATH-102912] Global Differential Geometry

ECTS	Language	Exam type	Version
8	deutsch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0100300		Vorlesung (V)	4	Wilderich Tuschmann
WS 18/19	0100310		Übung (Ü)	2	Wilderich Tuschmann

Conditions
none

T Course: Global Optimization I [T-WIWI-102726]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101413] Applications of Operations Research
[M-WIWI-101414] Methodical Foundations of OR
[M-WIWI-101473] Mathematical Programming

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550134		Vorlesung (V)	2	Oliver Stein
SS 2018	2550135		Übung (Ü)	1	Robert Mohr, Christoph Neumann, Oliver Stein

Learning Control / Examinations
Success is in the form of a written examination (60 min.) (according to § 4(2), 1 SPO) and possibly of a compulsory prerequisite.
The exam is offered in the lecture of semester and the following semester.
The success check can be done also with the success control for "Global optimization II". In this case, the duration of the written exam is 120 min.

Conditions
None

Modeled Conditions
The following conditions must be met:

- The course [T-WIWI-103638] *Global optimization I and II* must not have been started.

Recommendations
None

Remarks
Part I and II of the lecture are held consecutively in the *same*semester.

V Event excerpt: (SS 2018)

Aim
The student

- knows and understands the fundamentals of deterministic global optimization in the convex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the convex case in practice.

Content
In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.
Part I of the lecture treats methods for global optimization of convex functions under convex constraints. It is structured as follows:

- Introduction, examples, and terminology

- Existence results
- Optimality in convex optimization
- Duality, bounds, and constraint qualifications
- Numerical methods

Nonconvex optimization problems are treated in part II of the lecture.
The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004
- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000
- R. Horst, H. Tuy *Global Optimization* Springer 1996
- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990

T Course: Global optimization I and II [T-WIWI-103638]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101414] Methodical Foundations of OR
[M-WIWI-101473] Mathematical Programming

ECTS	Recurrence	Exam type	Version
9	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550134		Vorlesung (V)	2	Oliver Stein
SS 2018	2550136		Vorlesung (V)	2	Oliver Stein

Learning Control / Examinations
The assessment of the lecture is a written examination (120 minutes) according to §4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.
The examination is held in the semester of the lecture and in the following semester.

Conditions
None

Modeled Conditions
The following conditions must be met:

1. The course [T-WIWI-102726] *Global Optimization I* must not have been started.
2. The course [T-WIWI-102727] *Global Optimization II* must not have been started.

Recommendations
None

Remarks
Part I and II of the lecture are held consecutively in the *same* semester.

V Event excerpt: (SS 2018)

Aim
The student

- knows and understands the fundamentals of deterministic global optimization in the convex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the convex case in practice.

Content
In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.
Part I of the lecture treats methods for global optimization of convex functions under convex constraints. It is structured as follows:

- Introduction, examples, and terminology
- Existence results
- Optimality in convex optimization
- Duality, bounds, and constraint qualifications

- Numerical methods

Nonconvex optimization problems are treated in part II of the lecture.
The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004
- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000
- R. Horst, H. Tuy *Global Optimization* Springer 1996
- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990

V Event excerpt: (SS 2018)

Aim
The student

- knows and understands the fundamentals of deterministic global optimization in the nonconvex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the nonconvex case in practice.

Content
In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.
The global solution of convex optimization problems is subject of part I of the lecture.
Part II of the lecture treats methods for global optimization of nonconvex functions under nonconvex constraints. It is structured as follows:

- Introduction and examples
- Convex relaxation
- Interval arithmetic
- Convex relaxation via αBB method
- Branch and bound methods
- Lipschitz optimization

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004
- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000
- R. Horst, H. Tuy *Global Optimization* Springer 1996
- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990

T Course: Global Optimization II [T-WIWI-102727]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101414] Methodical Foundations of OR
[M-WIWI-101473] Mathematical Programming

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550135		Übung (Ü)	1	Robert Mohr, Christoph Neumann, Oliver Stein
SS 2018	2550136		Vorlesung (V)	2	Oliver Stein

Learning Control / Examinations
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.
The examination is held in the semester of the lecture and in the following semester.
The examination can also be combined with the examination of "Global optimization I". In this case, the duration of the written examination takes 120 minutes.

Conditions
None

Modeled Conditions
The following conditions must be met:

- The course [T-WIWI-103638] *Global optimization I and II* must not have been started.

Remarks
Part I and II of the lecture are held consecutively in the *same*semester.

V Event excerpt: (SS 2018)

Aim
The student

- knows and understands the fundamentals of deterministic global optimization in the nonconvex case,
- is able to choose, design and apply modern techniques of deterministic global optimization in the nonconvex case in practice.

Content
In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.
The global solution of convex optimization problems is subject of part I of the lecture.
Part II of the lecture treats methods for global optimization of nonconvex functions under nonconvex constraints. It is structured as follows:

- Introduction and examples
- Convex relaxation
- Interval arithmetic

- Convex relaxation via αBB method
- Branch and bound methods
- Lipschitz optimization

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004
- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000
- R. Horst, H. Tuy *Global Optimization* Springer 1996
- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990

T Course: Graph Theory [T-MATH-102273]

Responsibility: Maria Aksenovich
Contained in: [M-MATH-101336] Graph Theory

ECTS	Exam type	Version
8	Prüfungsleistung schriftlich	1

Conditions
None

Course: Graph Theory and Advanced Location Models [T-WIWI-102723]

Responsibility: Stefan Nickel
Contained in: [M-WIWI-101473] Mathematical Programming
[M-WIWI-103289] Stochastic Optimization
[M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations

The assessment is a 120 minutes written examination (according to §4(2), 1 of the examination regulation).
The examination is held in the term of the lecture and the following lecture.

Conditions

None

Recommendations

Basic knowledge as conveyed in the module*Introduction toOperations Research*[WI1OR] is assumed.

Remarks

The course is offered irregularly. Planned lectures for the next three years can be found in the internet at http://dol.ior.kit.edu/english/Courses.php.

T Course: Group Actions in Riemannian Geometry [T-MATH-105925]

Responsibility: Wilderich Tuschmann
Contained in: [M-MATH-102954] Group Actions in Riemannian Geometry

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

Conditions
none

T Course: Harmonic Analysis for Dispersive Equations [T-MATH-107071]

Responsibility: Peer Kunstmann
Contained in: [M-MATH-103545] Harmonic Analysis for Dispersive Equations

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	01053410		Übung (Ü)	1	N.N.
WS 18/19	0105350		Vorlesung (V)	2	Nikolaos Pattakos

Conditions
none

T Course: Heat Economy [T-WIWI-102695]

Responsibility: Wolf Fichtner
Contained in: [M-WIWI-101452] Energy Economics and Technology

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2581001	Heat Economy	Vorlesung (V)	2	Wolf Fichtner

Learning Control / Examinations
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Conditions
None.

Recommendations
None

Remarks
See German version.

V Event excerpt: Heat Economy (SS 2018)

Aim
The student gains detailed knowledge about heat generating technologies and their areas of application, in particular in the area of combined heat and power. The student is able to deal with technical and economic questions in this field.

Content
1. Introduction: Heat economy
2. CHP technologies (incl. calculation of profitability)
3. Heat systems (incl. calculation of profitability)
4. Distribution of heat
5. Demand for space heating and thermal insulation measures
6. Heat storage
7. Legal framework conditions
8. Laboratory experiment: compression heat pump

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

T Course: Homotopy Theory [T-MATH-105933]

Responsibility: Roman Sauer
Contained in: [M-MATH-102959] Homotopy Theory

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Human Factors in Security and Privacy [T-WIWI-109270]

Responsibility: Melanie Volkamer
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
5	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2511554		Vorlesung (V)	2	Melanie Volkamer
WS 18/19	2511555		Übung (Ü)	1	Melanie Volkamer

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (30 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Conditions
Successful participation in the exercises.

Remarks
New course starting winter term 2018/2019.

V Event excerpt: (WS 18/19)

Aim
Students . . .

- know why many existing security and privacy mechanisms are not usable and why many awareness/education/training approaches are not effective
- can explain for concrete examples why these are not usable / not effective including why people are likely to face problems with these
- can explain what mental models are, why they are important and how they can be identified
- know how to conduct a cognitive walkthrough to identify problems with existing mechanisms and approaches
- know how to conduct semi-structured interviews
- know how user studies in the security context differ from those conducted in other contexts
- can explain the process of human centered security / privacy by design
- know the advantages and disadvantages of various graphical password schemes
- know concepts such as just in time and place security interventions

Content
This lecture and the corresponding exercises discuss the various problems of existing security and privacy mechanisms and security and privacy awareness/education/training approaches. The lecture addresses relevant psychological and sociological aspects which are important to know and to consider when developing more usable security/privacy mechanisms and more effective awareness/education/training approaches. This includes the importance of mental models. The human centered security and privacy by design approach is introduced. Furthermore, some of the methodologies used in this area are explained and a subset of them is also applied. Finally, positive examples, such as graphical passwords, are introduced and discussed. Note, the main part of the exercise is replicating an interview based study.

Literature

- Usable Security: History, Themes, and Challenges (Synthesis Lectures on Information Security, Privacy, and Trust): Simson Garfinkel und Heather Richter Lipford. 2014
- Security and Usability: Designing Secure Systems that People Can Use von Lorrie Faith Cranor und Simson Garfinkel. 2005

- Melanie Volkamer, Karen Renaud: Mental Models - General Introduction and Review of Their Application to Human-Centred Security. In Number Theory and Cryptography (2013): 255-280: https://link.springer.com/chapter/10.1007/978-3-642-42001-6_18
- Paul Gerber, Marco Ghiglierie, Birgit Henhapl, Oksana Kulyk, Karola Marky, Peter Mayer, Benjamin Reinheimer, Melanie Volkamer: Human Factors in Security. In: Reuter C. (eds) Sicherheitskritische Mensch-Computer-Interaktion. Springer (2018) https://link.springer.com/chapter/10.1007/978-3-658-19523-6_5
- Bruce Schneier: Psychology of Security (2018): https://www.schneier.com/essays/archives/2008/01/the_psychology_of_se.html
- Ross Anderson: security /usability and psychology. In Security Engineering. http://www.cl.cam.ac.uk/~rja14/Papers/SEv2-c02.pdf
- Andrew Odlyzko: Economics, Psychology and Sociology of Security: http://www.dtc.umn.edu/~odlyzko/doc/econ.psych.security.pdf

T Course: Incentives in Organizations [T-WIWI-105781]

Responsibility: Petra Nieken
Contained in: [M-WIWI-101500] Microeconomic Theory
[M-WIWI-101505] Experimental Economics

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2573003	Incentives in Organizations	Vorlesung (V)	2	Petra Nieken
SS 2018	2573004	Übung zu Incentives in Organizations	Übung (Ü)	1	Mitarbeiter, Petra Nieken

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.
In case of a small number of registrations, we might offer an oral exam instead of a written exam.

Conditions
None

Recommendations
Knowledge of microeconomics, game theory, and statistics is assumed.

Remarks
The course is carried out routinely in summer.

V Event excerpt: Incentives in Organizations (SS 2018)

Aim
The student

- develops a strategic understanding about incentives systems and how they work.
- analyzes models from personnel economics. He / she is able to use both, standard economic models and behavioral models.
- understands how econometric methods can be used to analyze performance and compensation data. Is able to read and interpret results from regressions and derive economic relevance from those results.
- knows incentives schemes that are used in companies and is able to evaluate them critically.
- can develop practical implications which are based on theoretical models and empirical datafor companies.
- understands the challenges of managing incentive and compensation systems and their relationship with corporate strategy.

Content
The students acquire profound knowledge about the design and the impact of different incentive and compensation systems. Topics covered are, for instance, performance based compensation, team work, intrinsic motivation, multitasking, and subjective performance evaluations. We will use microeconomic or behavioral models as well as empirical data to analyze incentive systems. We will investigate several widely used compensation schemes and their relationship with corporate strategy. Students will learn to develop practical implications which are based on the acquired knowledge of this course.

Workload
The total workload for this course is approximately 135 hours.
Lecture 32h
Preparation of lecture 52h
Exam preparation 51h

Literature

Literature (mandatory): Slides, case studies, and selected research papers annolunced in the lecture
Literature (additional):
Brickley / Smith / Zimmerman: Managerial Economics and Organizantional Architecture
Camerer: Behavioral Game Theory
Lazear / Gibbs: Personnel Economics in Practice
Wooldridge: Introduction to Econometrics
Wooldridge: Econometric Analysis of Cross Section and Panel Data

T Course: Information Service Engineering [T-WIWI-106423]

Responsibility: Harald Sack
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511606		Vorlesung (V)	2	Harald Sack
SS 2018	2511607		Übung (Ü)	1	Harald Sack

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Conditions
None

Remarks
New course starting summer term 2017.

V Event excerpt: (SS 2018)

Aim

- The students know the fundamentals and measures of information theory and are able to apply those in the context of Information Service Engineering.
- The students have basic skills of natural language processing and are enabled to apply natural language processing technology to solve and evaluate simple text analysis tasks.
- The students have fundamental skills of knowledge representation with ontologies as well as basic knowledge of Semantic Web and Linked Data technologies. The students are able to apply these skills for simple representation and analysis tasks.
- The students have fundamental skills of information retrieval and are enabled to conduct and to evaluate simple information retrieval tasks.
- The students apply their skills of natural language processing, Linked Data engineering, and Information Retrieval to conduct and evaluate simple knowledge mining tasks.
- The students know the fundamentals of recommender systems as well as of semantic and exploratory search.

Content
- Information, Natural Language and the Web
- Natural Language Processing

  - NLP and Basic Linguistic Knowledge
  - NLP Applications, Techniques & Challenges
  - Evaluation, Precision and Recall
  - Regular Expressions and Automata
  - Tokenization
  - Language Model and N-Grams
  - Part-of-Speech Tagging

- Linked Data Engineering

  - Knowledge Representations and Ontologies

- What's in an URI?
- Resource Description Framework (RDF)
- Creating new Models with RDFS
- Querying RDF(S) with SPARQL
- More Expressivity with Web Ontology Language (OWL)
- The Web of Data
- Vocabularies and Ontologies in the Web of Data
- Wikipedia, DBpedia, and Wikidata

- Information Retrieval

- Information Retrieval Models
- Retrieval Evaluation
- Web Information Retrieval
- Document Crawling, Text Processing, and Indexing
- Query Processing and Result Representation
- Question Answering

- Knowledge Mining

- From Data to Knowledge
- Data Mining
- Machine Learning Basics for Knowledge Mining
- Mining Knowledge from Wikipedia
- Named Entity Resolution

- Exploratory Search and Recommender Systems

- Semantic Search and Entity Centric Search
- Collaborative Filtering and Content Based Recommendations
- From Search to Intelligent Browsing
- Linked Data Based Exploratory Search
- Fact Ranking

Literature

- D. Jurafsky, J.H. Martin, Speech and Language Processing, 2nd ed. Pearson Int., 2009.
- S. Hitzler, S. Rudolph, Foundations of Semantic Web Technologies, Chapman / Hall, 2009.
- R. Baeza-Yates, B. Ribeiro-Neto, Modern Information Retrieval, 2nd ed., Addison Wesley, 2010.#

T Course: Innovationtheory and -Policy [T-WIWI-102840]

Responsibility: Ingrid Ott
Contained in: [M-WIWI-101478] Innovation and Growth

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2560236	Innovationtheory and -policy	Vorlesung (V)		Ingrid Ott
SS 2018	2560237		Übung (Ü)		Levent Eraydin, Ingrid Ott

Learning Control / Examinations
The assessment consists of a written exam (60 min) according to Section 4(2), 1 of the examination regulation. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.
Students will be given the opportunity of writing and presenting a short paper during the lecture time to achieve a bonus on the exam grade. If the mandatory credit point exam is passed, the awarded bonus points will be added to the regular exam points. A deterioration is not possible by definition, and a grade does not necessarily improve, but is very likely to (not every additional point improves the total number of points, since a grade can not become better than 1). The voluntary elaboration of such a paper can not countervail a fail in the exam.

Conditions
None

Recommendations
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

V Event excerpt: Innovationtheory and -policy (SS 2018)

Aim
Students shall be given the ability to

- identify the importance of alternative incentive mechanisms for the emergence and dissemination of innovations
- understand the relationships between market structure and the development of innovation
- explain, in which situations market interventions by the state, for example taxes and subsidies, can be legitimized, and evaluate them in the light of economic welfare

Content

- Incentives for the emergence of innovations
- Patents
- Diffusion
- Impact of technological progress
- Innovation Policy

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Excerpt:

- Aghion, P., Howitt, P. (2009), The Economics of Growth, MIT Press, Cambridge MA.

- de la Fuente, A. (2000), Mathematical Methods and Models for Economists. Cambridge University Press, Cambridge, UK.
- Klodt, H. (1995), Grundlagen der Forschungs- und Technologiepolitik. Vahlen, München.
- Linde, R. (2000), Allokation, Wettbewerb, Verteilung - Theorie, UNIBUCH Verlag, Lüneburg.
- Ruttan, V. W. (2001), Technology, Growth, and Development. Oxford University Press, Oxford.
- Scotchmer, S. (2004), Incentives and Innovation, MIT Press.
- Tirole, Jean (1988), The Theory of Industrial Organization, MIT Press, Cambridge MA.

T Course: Insurance Marketing [T-WIWI-102601]

Responsibility: Edmund Schwake
Contained in: [M-WIWI-101469] Insurance Management I

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung mündlich	1

Learning Control / Examinations
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

Conditions
None

Recommendations
None

T Course: Insurance Production [T-WIWI-102648]

Responsibility: Ute Werner
Contained in: [M-WIWI-101469] Insurance Management I

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung mündlich	1

Learning Control / Examinations

The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).
T-WIWI-102648 Insurance Production will be offered latest until summer term 2017 (beginners only).

Conditions

None

Recommendations

None

Remarks

This course is offered on demand. For further information, see: http://insurance.fbv.kit.edu

T Course: Insurance Risk Management [T-WIWI-102636]

Responsibility: Harald Maser
Contained in: [M-WIWI-101469] Insurance Management I

ECTS	Recurrence	Exam type	Version
2.5	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment consists of a written or an oral exam (according to Section 4 (2), 1 or 2 of the examination regulation). T-WIWI-102636 Insurance Risk Management will be offered as a seminar starting summer term 2017. The examination will be offered latest until summer term 2017 (beginners only).

Conditions
None

Recommendations
None

Remarks
Block course. For organizational reasons, please register with the secretary of the chair: thomas.mueller3@kit.edu.

T Course: Integral Equations [T-MATH-105834]

Responsibility: Tilo Arens, Frank Hettlich, Andreas Kirsch
Contained in: [M-MATH-102874] Integral Equations

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0156900		Vorlesung (V)	4	Andreas Kirsch
SS 2018	0156910		Übung (Ü)	2	Andreas Kirsch

T Course: Interactive Information Systems [T-WIWI-108461]

Responsibility: Alexander Mädche, Stefan Morana
Contained in: [M-WIWI-104068] Information Systems in Organizations

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung anderer Art	3

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2540558	Interactive Information Systems	Vorlesung (V)	2	Alexander Mädche, Stefan Morana

Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.
Students receive one aggregated grade consisting of a written exam (70%) and research paper (30%). The exam and the research paper need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the research paper.

Conditions
None

Remarks
This course replaces T-WIWI-106342 "Interactive Systems" starting summer term 2018.
The course is held in english.

V Event excerpt: Interactive Information Systems (SS 2018)

Aim
The students
· know what interactive systems are and how they can be conceptualized
· explore the theoretical grounding of interactive systems leveraging theories from reference disciplines such as psychology
· know key concepts and design principles of specific classes of interactive systems (e.g. assistance, behavior change systems)
· get hands-on experience by analyzing existing interactive systems and suggesting enrichments based on the lecture contents.

Content
· Basics
· Theoretical foundations
· Key concepts and design principles for specific interactive systems classes
· Capstone project

Literature
The lecture bases to a large extend on
· Benyon, D. (2014). Designing interactive systems: A comprehensive guide to HCI, UX and interaction design (3. ed.). Harlow: Pearson.
Additional literature will be provided in the lecture.

T Course: International Finance [T-WIWI-102646]

Responsibility: Marliese Uhrig-Homburg
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530570	International Finance	Vorlesung (V)	2	Marliese Uhrig-Homburg, Ulrich Walter

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

Remarks
See German version.

V Event excerpt: International Finance (SS 2018)

Aim
The objective of this course is to become familiar with the basics of investment decisions on international markets and to manage foreign exchange risks.

Content
The main aspects of this course are the chances and the risks which are associated with international transactions. We carry out our analysis from two distinct perspectives: First the point of view of an international investor second that, of an international corporation. Several alternatives to the management of foreign exchange risks are shown. Due to the importance of foreign exchange risks, the first part of the course deals with currency markets. Furthermore current exchange rate theories are discussed.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Elective literature:

- Eiteman, D. et al., Multinational Business Finance, 13. edition, 2012.
- Solnik, B. and D. McLeavey, Global Investments, 6. edition, 2008.

T Course: Introduction into Particulate Flows [T-MATH-105911]

Responsibility: Willy Dörfler
Contained in: [M-MATH-102943] Introduction into Particulate Flows

ECTS	Exam type	Version
3	Prüfungsleistung mündlich	1

Conditions
none

T Course: Introduction to Geometric Measure Theory [T-MATH-105918]

Responsibility: Steffen Winter
Contained in: [M-MATH-102949] Introduction to Geometric Measure Theory

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

Conditions
none

T Course: Introduction to Kinetic Theory [T-MATH-108013]

Responsibility: Martin Frank
Contained in: [M-MATH-103919] Introduction to Kinetic Theory

ECTS	Language	Recurrence	Exam type	Version
4	englisch	Jedes Wintersemester	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0155450		Vorlesung (V)	2	Martin Frank
WS 18/19	0155460		Übung (Ü)	1	Martin Frank

Conditions
none

V Event excerpt: (WS 18/19)

Aim
After successfully taking part in the module's classes and exams, students have gained knowledge and abilities as described in the "Inhalt" section. Specifically, Students know common means of mesoscopic and macroscopic description of particle systems. Furthermore, students are able to describe the basics of multiscale methods, such as the asypmtotic analysis and the method of moments. Students are able to apply numerical methods to solve engineering problems related to particle systems. They can name the assumptions that are needed to be made in the process. Students can judge whether specific models are applicable to the specific problem and discuss their results with specialists and colleagues.

Content
- From Newton's equations to Boltzmann's equation
- Rigorous derivation of the linear Boltzmann equation
- Properties of kinetic equations (existence & uniqueness, H theorem)
- The diffusion limit
- From Boltzmann to Euler & Navier-Stokes
- Method of Moments
- Closure techniques
- Selected numerical methods

T Course: Introduction to Matlab and Numerical Algorithms [T-MATH-105913]

Responsibility: Daniel Weiß, Christian Wieners
Contained in: [M-MATH-102945] Introduction to Matlab and Numerical Algorithms

ECTS	Exam type	Version
5	Prüfungsleistung schriftlich	1

Conditions
none

T Course: Introduction to Scientific Computing [T-MATH-105837]

Responsibility: Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners
Contained in: [M-MATH-102889] Introduction to Scientific Computing

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0165000		Vorlesung (V)	3	Andreas Rieder
SS 2018	0166000		Praktikum (P)	3	Andreas Rieder

Course: Introduction to Stochastic Optimization [T-WIWI-106546]

Responsibility: Steffen Rebennack
Contained in: [M-WIWI-101414] Methodical Foundations of OR
[M-WIWI-103289] Stochastic Optimization
[M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550470		Vorlesung (V)		Steffen Rebennack
SS 2018	2550471		Übung (Ü)		Assistenten, Steffen Rebennack

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Conditions
None.

T Course: Inverse Problems [T-MATH-105835]

Responsibility: Tilo Arens, Frank Hettlich, Andreas Kirsch, Andreas Rieder
Contained in: [M-MATH-102890] Inverse Problems

ECTS	Language	Exam type	Version
8	deutsch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0105100		Vorlesung (V)	4	Roland Griesmaier
WS 18/19	0105110		Übung (Ü)	2	Roland Griesmaier

T Course: Key Moments in Geometry [T-MATH-108401]

Responsibility: Wilderich Tuschmann
Contained in: [M-MATH-104057] Key Moments in Geometry

ECTS	Recurrence	Exam type	Version
5	Unregelmäßig	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0154850		Vorlesung (V)	2	Wilderich Tuschmann
SS 2018	0154860		Übung (Ü)	2	Wilderich Tuschmann

Conditions
none

T Course: Knowledge Discovery [T-WIWI-102666]

Responsibility: York Sure-Vetter
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2511302	Knowledge Discovery	Vorlesung (V)	2	Achim Rettinger, York Sure-Vetter
WS 18/19	2511303	Exercises to Knowledge Discovery	Übung (Ü)	1	Achim Rettinger, York Sure-Vetter, Steffen Thoma, Tobias Weller

Learning Control / Examinations
The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation.
Students can be awarded a bonus on their final grade if they successfully complete special assignments.

Conditions
None

V Event excerpt: Knowledge Discovery (WS 18/19)

Aim
Students

- know fundamentals of Machine Learning, Data Mining and Knowledge Discovery.
- are able to design, train and evaluate adaptive systems.
- conduct Knowledge Discovery projects in regards to algorithms, representations and applications.

Content
Topics of the lectures comprise the whole Machine Learning and Data Mining process like CRISP, data warehousing, OLAP-techniques, learning algorithms, visualization and empircial evaluation. Covered learning techniques range from traditional approaches like decision trees, neural networks and support vector machines to selected approaches resulting from current research. Discussed learning problems are amongst others feauturevector-based learning, text mining and social network analysis.

Workload

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preperation and postprocessing: 67.5 hours
- Exam and exam preperation: 37.5 hours

Literature

- T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning: Data Mining, Inference, and Prediction (http://www-stat.stanford.edu/~tibs/ElemStatLearn/)
- T. Mitchell. Machine Learning. 1997
- M. Berhold, D. Hand (eds). Intelligent Data Analysis - An Introduction. 2003
- P. Tan, M. Steinbach, V. Kumar: Introduction to Data Mining, 2005, Addison Wesley

T Course: L2-Invariants [T-MATH-105924]

Responsibility: Holger Kammeyer, Roman Sauer
Contained in: [M-MATH-102952] L2-Invariants

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

Conditions
none

Course: Large-scale Optimization [T-WIWI-106549]

Responsibility: Steffen Rebennack

Contained in: [M-WIWI-101473] Mathematical Programming
[M-WIWI-103289] Stochastic Optimization
[M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Unregelmäßig	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550475		Vorlesung (V)	2	Steffen Rebennack
SS 2018	2550476		Übung (Ü)	1	Steffen Rebennack

Learning Control / Examinations

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Conditions

None.

T Course: Lie groups and Lie algebras [T-MATH-108799]

Responsibility: Enrico Leuzinger
Contained in: [M-MATH-104261] Lie groups and Lie algebras

ECTS	Language	Recurrence	Version
8	deutsch	Unregelmäßig	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0106000		Vorlesung (V)	4	Enrico Leuzinger
WS 18/19	0106010		Übung (Ü)	2	Enrico Leuzinger

T Course: Machine Learning 1 - Basic Methods [T-WIWI-106340]

Responsibility: Johann Marius Zöllner
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	24150	Machine Learning 1 - Basic methods	Vorlesung (V)	2	Rüdiger Dillmann, Johann Marius Zöllner

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Conditions
None.

Remarks
New course starting winter term 2017/2018.

V Event excerpt: Machine Learning 1 - Basic methods (WS 18/19)

Aim

- Studierende erlangen Kenntnis der grundlegenden Methoden im Bereich des Maschinellen Lernens.
- Studierende können Methoden des Maschinellen Lernens einordnen, formal beschreiben und bewerten.
- Die Studierenden können ihr Wissen für die Auswahl geeigneter Modelle und Methoden für ausgewählte Probleme im Bereich des Maschinellen Lernens einsetzen.

Content
Das Themenfeld Wissensakquisition und Maschinelles Lernen ist ein stark expandierendes Wissensgebiet und Gegenstand zahlreicher Forschungs- und Entwicklungsvorhaben. Der Wissenserwerb kann dabei auf unterschiedliche Weise erfolgen. So kann ein System Nutzen aus bereits gemachten Erfahrungen ziehen, es kann trainiert werden, oder es zieht Schlüsse aus umfangreichem Hintergrundwissen.
Die Vorlesung behandelt sowohl symbolische Lernverfahren, wie induktives Lernen (Lernen aus Beispielen, Lernen durch Beobachtung), deduktives Lernen (Erklärungsbasiertes Lernen) und Lernen aus Analogien, als auch subsymbolische Techniken wie Neuronale Netze, Support Vektor-Maschinen, Genetische Algorithmen und Reinforcement Lernen. Die Vorlesung führt in die Grundprinzipien sowie Grundstrukturen lernender Systeme und der Lerntheorie ein und untersucht die bisher entwickelten Algorithmen. Der Aufbau sowie die Arbeitsweise lernender Systeme wird an einigen Beispielen, insbesondere aus den Gebieten Robotik, autonome mobile Systeme und Bildverarbeitung vorgestellt und erläutert.

Workload
Vorlesung mit 2 SWS, plus Nachbereitung durch die Studierenden.

T Course: Machine Learning 2 – Advanced Methods [T-WIWI-106341]

Responsibility: Johann Marius Zöllner
Contained in: [M-WIWI-101637] Analytics and Statistics
[M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511502	Machine Learning 2 - Advanced methods	Vorlesung (V)	2	Johann Marius Zöllner
SS 2018	2511503	Exercises for Machine Learning 2 - Advanced Methods	Übung (Ü)	1	Johann Marius Zöllner

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Conditions
None.

Remarks
New course starting summer term 2017.

V Event excerpt: Machine Learning 2 - Advanced methods (SS 2018)

Aim

- Students understand extended concepts of machine learning and their possible applications.
- Students can classify, formally describe and evaluate methods of machine learning.
- In detail, methods of machine learning can be embedded and applied in complex decision and inference systems.
- Students can use their knowledge to select suitable models and methods of machine learning for existing problems in the field of machine intelligence.

Content
The subject area of machine intelligence and, in particular, machine learning, taking into account real challenges of complex application domains, is a rapidly expanding field of knowledge and the subject of numerous research and development projects.
The lecture "Machine Learning 2" deals with advanced methods of machine learning such as semi-supervised and active learning, deep neural networks (deep learning), pulsed networks, hierarchical approaches, e.g. As well as dynamic, probabilistic relational methods. Another focus is the embedding and application of machine learning methods in real systems.
The lecture introduces the latest basic principles as well as extended basic structures and elucidates previously developed algorithms. The structure and the mode of operation of the methods and methods are presented and explained by means of some application scenarios, especially in the field of technical (sub) autonomous systems (robotics, neurorobotics, image processing, etc.).

Workload
Vorlesung mit 2 SWS, plus Nachbereitung durch die Studierenden.

Literature
The slides are available as a PDF
Related Literature

- Artificial Intelligence: A Modern Approach - Peter Norvig and Stuart J. Russell
- Machine Learning - Tom Mitchell
- Pattern Recognition and Machine Learning - Christopher M. Bishop
- Reinforcement Learning: An Introduction - Richard S. Sutton and Andrew G. Barto
- Deep Learning - Ian Goodfellow, Yoshua Bengio, Aaron Courville

Further (specific) literature on individual topics will be given in the lecture.

T Course: Management of IT-Projects [T-WIWI-102667]

Responsibility: Roland Schätzle
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511214	Management of IT-Projects	Vorlesung (V)	2	Roland Schätzle
SS 2018	2511215		Übung (Ü)	1	Roland Schätzle

Learning Control / Examinations
The assessment of this course is a written examination (60 min) in the first week after lecture period according to Section 4(2), 1 of the examination regulation.

Conditions
None.

V Event excerpt: Management of IT-Projects (SS 2018)

Aim
Students

- explain the terminology of IT project management and typical used methods for planning, handling and controlling,
- apply methods appropiate to current project phases and project contexts,
- consider organisational and social impact factors.

Content
The lecture deals with the general framework, impact factors and methods for planning, handling, and controlling of IT projects. Especially following topics are addressed:

- project environment
- project organisation
- project planning including the following items:
  - plan of the project structure
  - flow chart
  - project schedule
  - plan of resources
- effort estimation
- project infrastructur
- project controlling
- risk management
- feasibility studies
- decision processes, conduct of negotiations, time management.

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h

Exam preparation 44h
Exam &1h

Total: 150h

Literature

- B. Hindel, K. Hörmann, M. Müller, J. Schmied. Basiswissen Software-Projektmanagement. dpunkt.verlag 2004
- Project Management Institute Standards Committee. A Guide to the Project Management Body of Knowledge (PMBoK guide). Project Management Institute. Four Campus Boulevard. Newton Square. PA 190733299. U.S.A.

Further literature is given in each lecture individually.

T Course: Market Research [T-WIWI-107720]

Responsibility:
Contained in: [M-WIWI-101490] Marketing Management

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2571150	Market Research	Vorlesung (V)	2	Martin Klarmann
SS 2018	2571151	Market Research Tutorial	Übung (Ü)	1	Maximilian Lüders

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
None

Remarks
Please note that this course has to be completed successfully by students interested in master thesis positions at the Marketing & Sales Research Group.

V Event excerpt: Market Research (SS 2018)

Aim
Topics addressed in this course are for example:

Theoretical priciples of market research
Statistical foundations of market research
Measuring customer attitudes
Understanding of customer reactions
Strategical decision making

Content
Topics addressed in this course are for example:

- Theoretical foundations of market research
- Statistical foundations of market research
- Measuring customer attitudes
- Understanding customer reactions
- Strategical decision making

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T Course: Marketing Strategy Business Game [T-WIWI-102835]

Responsibility: Martin Klarmann
Contained in: [M-WIWI-101490] Marketing Management

ECTS	Language	Recurrence	Exam type	Version
1.5	deutsch	Jedes Sommersemester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2571183	Marketing Strategy Business Game	Block (B)	1	Assistenten, Martin Klarmann

Learning Control / Examinations
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015). The assessment consists of a group presentation and a subsequent round of questions totalling 20 minutes.

Conditions
None

Recommendations
None

Remarks
Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop.
Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.
In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in summer term starts.

V Event excerpt: Marketing Strategy Business Game (SS 2018)

Aim
Students
- are able to operate the strategic marketing simulation software "Markstrat"
- are able to take strategic marketing decisions in groups
- know how to apply strategic marketing concepts to practical contexts (e.g. for market segmentation, product launches, coordination of the marketing mix, market research, choice of the distribution channel or competitive behavior)
- are capable to collect and to select information usefully with the aim of decision-making
- are able to react appropriately to predetermined market conditions
- know how to present their strategies in a clear and consistent way
- are able to talk about the success, problems, critical incidents, external influences and strategy changes during the experimental game and to reflect and present their learning success

Content
Using Markstrat, a marketing strategy business game, students work in groups representing a company that competes on a simulated market against the other groups' companies.

Workload
The total workload for this course is approximately 45.0 hours. For further information see German version.

Literature
Homburg, Christian (2016), Marketingmanagement, 6. ed., Wiesbaden.

T Course: Markov Decision Processes [T-MATH-105921]

Responsibility: Nicole Bäuerle
Contained in: [M-MATH-102907] Markov Decision Processes

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0159900		Vorlesung (V)	2	Nicole Bäuerle
SS 2018	0159910		Übung (Ü)	1	Nicole Bäuerle

Conditions
none

T Course: Master Thesis [T-MATH-105878]

Responsibility: Sebastian Grensing
Contained in: [M-MATH-102917] Master Thesis

ECTS	Exam type	Version
30	Abschlussarbeit	1

T Course: Mathematical Methods in Signal and Image Processing [T-MATH-105862]

Responsibility: Andreas Rieder
Contained in: [M-MATH-102897] Mathematical Methods in Signal and Image Processing

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Conditions
none

T Course: Mathematical Methods of Imaging [T-MATH-106488]

Responsibility: Andreas Rieder
Contained in: [M-MATH-103260] Mathematical Methods of Imaging

ECTS	Recurrence	Exam type	Version
5	Unregelmäßig	Prüfungsleistung mündlich	1

Conditions
None

T Course: Mathematical Modelling and Simulation in Practise [T-MATH-105889]

Responsibility: Gudrun Thäter
Contained in: [M-MATH-102929] Mathematical Modelling and Simulation in Practise

ECTS	Language	Exam type	Version
4	englisch	Prüfungsleistung mündlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0109400		Vorlesung (V)	2	Gudrun Thäter
WS 18/19	0109410		Übung (Ü)	1	Gudrun Thäter

V Event excerpt: (WS 18/19)

Literature
Hans-Joachim Bungartz e.a.: Modeling and Simulation: An Application-Oriented Introduction, Springer, 2013 (English)

T Course: Mathematical Statistics [T-MATH-105872]

Responsibility: Norbert Henze, Bernhard Klar
Contained in: [M-MATH-102909] Mathematical Statistics

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0162300		Vorlesung (V)	2	Bruno Ebner
SS 2018	0162310		Übung (Ü)	1	Bruno Ebner

Conditions
none

T Course: Mathematical Topics in Kinetic Theory [T-MATH-108403]

Responsibility: Dirk Hundertmark
Contained in: [M-MATH-104059] Mathematical Topics in Kinetic Theory

ECTS	Recurrence	Exam type	Version
4	Unregelmäßig	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0102700		Vorlesung (V)	2	Tobias Ried
SS 2018	0102710		Übung (Ü)	1	Tobias Ried

Conditions
none

T Course: Maxwell's Equations [T-MATH-105856]

Responsibility: Tilo Arens, Frank Hettlich, Andreas Kirsch
Contained in: [M-MATH-102885] Maxwell's Equations

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Course: Medical Imaging [T-MATH-105861]

Responsibility: Andreas Rieder
Contained in: [M-MATH-102896] Medical Imaging

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Conditions
none

T Course: Mixed Integer Programming I [T-WIWI-102719]

Responsibility: Oliver Stein

Contained in: [M-WIWI-101473] Mathematical Programming
[M-WIWI-103289] Stochastic Optimization
[M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The examination is held in the semester of the lecture and in the following semester.

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

The examination can also be combined with the examination of *Mixed Integer Programming II*[25140]. In this case, the duration of the written examination takes 120 minutes.

Conditions

None

Recommendations

It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Remarks

The lecture is offered irregularly. The curriculum of the next three years is available online (kop.ior.kit.edu).

T Course: Mixed Integer Programming II [T-WIWI-102720]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101473] Mathematical Programming
[M-WIWI-103289] Stochastic Optimization
[M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550140		Vorlesung (V)	2	Oliver Stein
SS 2018	2550141		Übung (Ü)	1	Christoph Neumann, Oliver Stein

Learning Control / Examinations
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.

The examination is held in the semester of the lecture and in the following semester.

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

The examination can also be combined with the examination of*Mixed Integer Programming I*[2550138]. In this case, the duration of the written examination takes 120 minutes.

Conditions
None

Recommendations
It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Remarks
The lecture is offered irregularly. The curriculum of the next three years is available online (kop.ior.kit.edu).

V Event excerpt: (SS 2018)

Aim
The student

- knows and understands the fundamentals of convex and of nonconvex mixed integer programming,
- is able to choose, design and apply modern techniques of nonlinear mixed integer programming in practice.

Content
Many optimization problems from economics, engineering and natural sciences are modeled with continuous as well as discrete variables. Examples are the energy minimal design of a chemical process in which several reactors may be switched on or off, or the time minimal covering of a distance with a vehicle equipped with a gear shift. While optimal points can be defined straightforwardly, for their numerical identification an interplay of ideas from discrete and continuous optimization is necessary. Part I of the lecture deals with linear mixed integer programs.
Part II treats methods for the numerical solution of optimization problems which depend nonlinearly on continuous as well as discrete variables. It is structured as follows:

- Concepts of convex optimization
- Mixed integer convex programming (branch and bound methods)
- Mixed integer nonconvex programming
- Generalized Benders decomposition
- Outer approximation methods
- Heuristics

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Elective literature:

- C.A. Floudas, Nonlinear and Mixed-Integer Optimization: Fundamentals and Applications, Oxford University Press, 1995
- J. Kallrath: Gemischt-ganzzahlige Optimierung, Vieweg, 2002
- D. Li, X. Sun: Nonlinear Integer Programming, Springer, 2006
- G.L. Nemhauser, L.A. Wolsey, Integer and Combinatorial Optimization, Wiley, 1988
- M. Tawarmalani, N.V. Sahinidis, Convexification and Global Optimization in Continuous and Mixed-Integer Nonlinear Programming, Kluwer, 2002.

T Course: Modeling and OR-Software: Advanced Topics [T-WIWI-106200]

Responsibility: Stefan Nickel
Contained in: [M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Semester	Prüfungsleistung anderer Art	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550490		Praktikum (P)	3	Stefan Nickel, Melanie Reuter-Oppermann

Learning Control / Examinations
The assessment is a 120 minutes examination, including a written and a practical part (according to §4(2), 1 of the examination regulation).
The examination is held in the term of the software laboratory and the following term.

Conditions
None.

Recommendations
Basic knowledge as conveyed in the module*Introduction toOperations Research*is assumed.
Successful completion of the courseModeling and OR-Software: Introduction.

Remarks
Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.
The lecture is held in every term. The planned lectures and courses for the next three years are announced online.

V Event excerpt: (SS 2018)

Aim
The student

- is an expert in using computer systems to model and solve industry-related optimization problems,
- conducts an advanced approach to modeling and implementation software for OR models and is able to use them in practice,
- knows and explains the practical application possibilities of OR software in complex combinatorial and nonlinear optimization problems.

Content
The task of solving combinatorial and nonlinear optimization problems imposes much higher requirements on suggested solution approaches as in linear programming.
During the course of this software laboratory, students get to know important methods from combinatorial optimization, e.g. Branch & Cut- or Column Generation methods and are enabled to solve problems with the software system IBM ILOG CPLEX Optimization Studio and the corresponding modeling language OPL. In addition, issues of nonlinear optimization, e.g. quadratic optimization, are addressed. As an important part of the software laboratory, students get the possibility to model combinatorial and nonlinear problems and implement solution approaches in the software system.
The software laboratory also introduces some of the most frequently used modelling and programming languages that are used in practice to solve optimization problems.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

T Course: Modeling and OR-Software: Introduction [T-WIWI-106199]

Responsibility: Stefan Nickel
Contained in: [M-WIWI-101413] Applications of Operations Research

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2550490		Praktikum (P)	3	Stefan Nickel, Melanie Reuter-Oppermann

Learning Control / Examinations
The assessment is a 120 minutes examination, including a written and a practical part (according to §4(2), 1 of the examination regulation).
The examination is held in the term of the software laboratory and the following term.

Conditions
None

Recommendations
Firm knowledge of the contents from the lecture*Introduction to Operations Research I*[2550040] of the module*Operations Research*[WW1OR].

Remarks
Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.
The lecture is offered in every term. The planned lectures and courses for the next three years are announced online.

V Event excerpt: (WS 18/19)

Aim
The student

- evaluates the possibilities of computer usage in practical applications of Operations Research,
- is capable of classifying and utilizing the general possibilities and fields of usage of modeling and implementation software for solving OR models in practice,
- models and solves problems arising in industry applications with the aid of computer-supported optimization methods.

Content
After an introduction to general concepts of modelling tools (implementation, data handling, result interpretation, ...), the software IBM ILOG CPLEX Optimization Studio and the corresponding modeling language OPL will be discussed which can be used to solve OR problems on a computer-aided basis.
Subsequently, a broad range of exercises will be discussed. The main goals of the exercises from literature and practical applications are to learn the process of modeling optimization problems as linear or mixed-integer programs, to efficiently utilize the presented tools for solving these optimization problems and to implement heuristic solution procedures for mixed-integer programs.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Course: Modelling, Measuring and Managing of Extreme Risks [T-WIWI-102841]

Responsibility: Ute Werner
Contained in: [M-WIWI-101469] Insurance Management I

ECTS	Recurrence	Exam type	Version
2.5	Jedes Sommersemester	Prüfungsleistung anderer Art	1

Learning Control / Examinations
Non exam assessment (following §4(2), 3 of the examination regulation).
T-WIWI-102841 Modelling, Measuring and Managing of Extreme Risks will be offered latest until summer term 2017 (beginners only).

Conditions
None

Recommendations
None

T Course: Multivariate Statistical Methods [T-WIWI-103124]

Responsibility: Oliver Grothe
Contained in: [M-WIWI-101637] Analytics and Statistics
[M-WIWI-101639] Econometrics and Statistics II
[M-WIWI-103289] Stochastic Optimization

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550554		Vorlesung (V)	2	Oliver Grothe
SS 2018	2550555		Übung (Ü)	2	Maximilian Coblenz, Oliver Grothe

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. A bonus program can improve the grade by one grade level (i.e. by 0.3 or 0.4).
The exam is offered every semester. Re-examinations are offered only for repeaters.

Conditions
None

Recommendations
The course covers highly advanced statistical methods with a quantitative focus. Hence, participants are necessarily expected to have advanced statistical knowledge, e.g. acquired in the course ''Advanced Statistics''. Without this, participation in the course is not advised.
Previous attendance of the course Analysis of Multivariate Data is recommended. Alternatively, the script can be provided to interested students.

V Event excerpt: (SS 2018)

Aim
Students

- choose appropriate methods for the illustration of multivariate data and apply these.
- choose appropriate methods for structure analysis and apply these.
- choose appropriate methods for dimension reduction and apply these.
- apply software.

Content
Graphical methods for multivariate Data
Regression Analysis (incl. logistic regression, Ridge and Lasso)
Principal Component, and Correspondence Analysis
Local linear Embedding
Multidimensional Scaling
Hierarchical Classification

Literature
Comprehensive lecture notes

T Course: Nature-Inspired Optimisation Methods [T-WIWI-102679]

Responsibility: Pradyumn Kumar Shukla
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511106		Vorlesung (V)	2	Pradyumn Kumar Shukla

Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to Section 4(2), 1 of the examination regulation) and an additional written examination called "bonus exam", 60 min (according Section 4(2), 3 of the examination regulation) or a selection of exersices . The bonus exam may be split into several shorter written tests.
The grade of this course is the achieved grade in the written examination. If this grade is at least 4.0 and at most 1.3, a passed bonus exam will improve it by one grade level (i.e. by 0.3 or 0.4).

Conditions
None

V Event excerpt: (SS 2018)

Aim
To learn:

1. Different nature-inspired methods: local search, simulated annealing, tabu search, evolutionary algorithms, ant colony optimization, particle swarm optimization
2. Different aspects and limitation of the methods
3. Applications of such methods
4. Multi-objective optimization methods
5. Constraint handling methods
6. Different aspects in parallelization and computing platforms

Content
Many optimization problems are too complex to be solved to optimality. A promising alternative is to use stochastic heuristics, based on some fundamental principles observed in nature. Examples include evolutionary algorithms, ant algorithms, or simulated annealing. These methods are widely applicable and have proven very powerful in practice. During the course, such optimization methods based on natural principles are presented, analyzed and compared. Since the algorithms are usually quite computational intensive, possibilities for parallelization are also investigated.

Literature
* E. L. Aarts and J. K. Lenstra: 'Local Search in Combinatorial Optimization'. Wiley, 1997 * D. Corne and M. Dorigo and F. Glover: 'New Ideas in Optimization'. McGraw-Hill, 1999 * C. Reeves: 'Modern Heuristic Techniques for Combinatorial Optimization'. McGraw-Hill, 1995 * Z. Michalewicz, D. B. Fogel: How to solve it: Modern Heuristics. Springer, 1999 * E. Bonabeau, M. Dorigo, G. Theraulaz: 'Swarm Intelligence'. Oxford University Press, 1999 * A. E. Eiben, J. E. Smith: 'Introduction to Evolutionary Computation'. * M. Dorigo, T. Stützle: 'Ant Colony Optimization'. Bradford Book, 2004 Springer, 2003

T Course: Non- and Semiparametrics [T-WIWI-103126]

Responsibility: Melanie Schienle

Contained in: [M-WIWI-101638] Econometrics and Statistics I
[M-WIWI-101639] Econometrics and Statistics II

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
Knowledge of the contents covered by the course *"Applied Econometrics"* [2520020]

Remarks
The course takes place every second winter semester: 2018/19 then 2020/21

T Course: Nonlinear Analysis [T-MATH-107065]

Responsibility: Tobias Lamm
Contained in: [M-MATH-103539] Nonlinear Analysis

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung mündlich	1

Conditions
none

T Course: Nonlinear Maxwell Equations [T-MATH-106484]

Responsibility: Roland Schnaubelt
Contained in: [M-MATH-103257] Nonlinear Maxwell Equations

ECTS	Recurrence	Exam type	Version
3	Unregelmäßig	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0154620		Vorlesung (V)		Jaroslaw Mederski

Conditions
Keine

T Course: Nonlinear Optimization I [T-WIWI-102724]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101414] Methodical Foundations of OR
[M-WIWI-101473] Mathematical Programming

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	3

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2550111		Vorlesung (V)	2	Oliver Stein
WS 18/19	2550112		Übung (Ü)		Robert Mohr, Oliver Stein
WS 18/19	2550142		Übung (Ü)		Robert Mohr, Oliver Stein

Learning Control / Examinations
The assessment consits of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.
The exam takes place in the semester of the lecture and in the following semester.
The examination can also be combined with the examination of*Nonlinear OptimizationII*[2550113]. In this case, the duration of the written examination takes 120 minutes.

Conditions
The module component exam T-WIWI-103637 "Nonlinear Optimization I and II" may not be selected.

Remarks
Part I and II of the lecture are held consecutively in the *same*semester.

V Event excerpt: (WS 18/19)

Aim
The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

Content
The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality condtions for unconstrained problems
- Optimality conditions for unconstrained convex problems
- Numerical methods for unconstrained problems (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

Constrained problems are the contents of part II of the lecture.
The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T Course: Nonlinear Optimization I and II [T-WIWI-103637]

Responsibility: Oliver Stein

Contained in: [M-WIWI-101414] Methodical Foundations of OR
[M-WIWI-101473] Mathematical Programming

ECTS	Recurrence	Exam type	Version
9	Jedes Wintersemester	Prüfungsleistung schriftlich	5

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2550111		Vorlesung (V)	2	Oliver Stein
WS 18/19	2550112		Übung (Ü)		Robert Mohr, Oliver Stein
WS 18/19	2550113		Vorlesung (V)	2	Oliver Stein
WS 18/19	2550142		Übung (Ü)		Robert Mohr, Oliver Stein

Learning Control / Examinations
The assessment consits of a written exam (120 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.
The exam takes place in the semester of the lecture and in the following semester.

Conditions
None.

Remarks
Part I and II of the lecture are held consecutively in the **same** semester.

V Event excerpt: (WS 18/19)

Aim
The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

Content
The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality condtions for unconstrained problems
- Optimality conditions for unconstrained convex problems
- Numerical methods for unconstrained problems (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

Constrained problems are the contents of part II of the lecture.
The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

V Event excerpt: (WS 18/19)

Aim
The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

Content
The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. Part I of the lecture treats unconstrained optimization problems. Part II of the lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions for constrained problems
- Optimality conditions for constrained convex problems
- Numerical methods for constrained problems (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T Course: Nonlinear Optimization II [T-WIWI-102725]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101414] Methodical Foundations of OR
[M-WIWI-101473] Mathematical Programming

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2550112		Übung (Ü)		Robert Mohr, Oliver Stein
WS 18/19	2550113		Vorlesung (V)	2	Oliver Stein

Learning Control / Examinations
The assessment consits of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.
The exam takes place in the semester of the lecture and in the following semester.
The exam can also be combined with the examination of *Nonlinear OptimizationI* [2550111]. In this case, the duration of the written exam takes 120 minutes.

Conditions
None.

Remarks
Part I and II of the lecture are held consecutively in the same semester.

V Event excerpt: (WS 18/19)

Aim
The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

Content
The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. Part I of the lecture treats unconstrained optimization problems. Part II of the lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions for constrained problems
- Optimality conditions for constrained convex problems
- Numerical methods for constrained problems (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002

- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T Course: Nonparametric Statistics [T-MATH-105873]

Responsibility: Norbert Henze, Bernhard Klar
Contained in: [M-MATH-102910] Nonparametric Statistics

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0162300		Vorlesung (V)	2	Bernhard Klar
WS 18/19	0162310		Übung (Ü)	1	Bernhard Klar

T Course: Numerical Continuation Methods [T-MATH-105912]

Responsibility: Jens Rottmann-Matthes
Contained in: [M-MATH-102944] Numerical Continuation Methods

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

Conditions
none

T Course: Numerical Linear Algebra for Scientific High Performance Computing [T-MATH-107497]

Responsibility: Hartwig Anzt
Contained in: [M-MATH-103709] Numerical Linear Algebra for Scientific High Performance Computing

ECTS	Recurrence	Exam type	Version
3	Unregelmäßig	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0110650		Vorlesung (V)	2	Hartwig Anzt

Conditions
none

T Course: Numerical Linear Algebra in Image Processing [T-MATH-108402]

Responsibility: Volker Grimm
Contained in: [M-MATH-104058] Numerical Linear Algebra in Image Processing

ECTS	Recurrence	Exam type	Version
6	Unregelmäßig	Studienleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0178200		Vorlesung (V)	3+1	Volker Grimm
SS 2018	0178210		Übung (Ü)	1	Volker Grimm

Conditions
none

T Course: Numerical Methods for Differential Equations [T-MATH-105836]

Responsibility: Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners
Contained in: [M-MATH-102888] Numerical Methods for Differential Equations

ECTS	Exam type	Version
8	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0110700		Vorlesung (V)	4	Christian Wieners
WS 18/19	0110800		Übung (Ü)	2	Christian Wieners

T Course: Numerical Methods for Hyperbolic Equations [T-MATH-105900]

Responsibility: Willy Dörfler
Contained in: [M-MATH-102915] Numerical Methods for Hyperbolic Equations

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

Conditions
none

T Course: Numerical Methods for Integral Equations [T-MATH-105901]

Responsibility: Tilo Arens, Frank Hettlich, Andreas Kirsch
Contained in: [M-MATH-102930] Numerical Methods for Integral Equations

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0112600		Vorlesung (V)	4	Tilo Arens
WS 18/19	0112610		Übung (Ü)	2	Tilo Arens

T Course: Numerical Methods for Maxwell's Equations [T-MATH-105920]

Responsibility: Marlis Hochbruck, Tobias Jahnke
Contained in: [M-MATH-102931] Numerical Methods for Maxwell's Equations

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

T Course: Numerical Methods for Time-Dependent Partial Differential Equations [T-MATH-105899]

Responsibility: Marlis Hochbruck, Tobias Jahnke
Contained in: [M-MATH-102928] Numerical Methods for Time-Dependent Partial Differential Equations

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0164500		Vorlesung (V)	4	Marlis Hochbruck
SS 2018	0164510		Übung (Ü)	2	Marlis Hochbruck

T Course: Numerical Methods in Computational Electrodynamics [T-MATH-105860]

Responsibility: Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners
Contained in: [M-MATH-102894] Numerical Methods in Computational Electrodynamics

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0167000		Vorlesung (V)	3	Willy Dörfler
SS 2018	0167010		Übung (Ü)	1	Willy Dörfler

Conditions
none

T Course: Numerical Methods in Fluid Mechanics [T-MATH-105902]

Responsibility: Willy Dörfler, Gudrun Thäter
Contained in: [M-MATH-102932] Numerical Methods in Fluid Mechanics

ECTS	Language	Exam type	Version
4	englisch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0161600		Vorlesung (V)	2	Willy Dörfler
SS 2018	0161610		Übung (Ü)	1	Willy Dörfler

T Course: Numerical Methods in Mathematical Finance [T-MATH-105865]

Responsibility: Tobias Jahnke
Contained in: [M-MATH-102901] Numerical Methods in Mathematical Finance

ECTS	Language	Exam type	Version
8	deutsch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0107800		Vorlesung (V)	4	Tobias Jahnke
WS 18/19	0107900		Übung (Ü)	2	Tobias Jahnke

Conditions
none

T Course: Numerical Methods in Mathematical Finance II [T-MATH-105880]

Responsibility: Tobias Jahnke
Contained in: [M-MATH-102914] Numerical Methods in Mathematical Finance II

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Learning Control / Examinations
Mündliche Prüfung im Umfang von ca. 30 Minuten

Conditions
none

T Course: Numerical Optimisation Methods [T-MATH-105858]

Responsibility: Willy Dörfler, Marlis Hochbruck, Tobias Jahnke, Andreas Rieder, Christian Wieners
Contained in: [M-MATH-102892] Numerical Optimisation Methods

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Operations Research in Health Care Management [T-WIWI-102884]

Responsibility: Stefan Nickel
Contained in: [M-WIWI-102805] Service Operations

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment is a 120 minutes written examination (according to §4(2), 1 of the examination regulation).
The examination is held in the term of the lecture and the following lecture.

Conditions
None

Recommendations
Basic knowledge as conveyed in the module*Introduction toOperations Research*[WI1OR] is assumed.

Remarks
The course is offered irregularly. Planned lectures for the next three years can be found in the internet at http://dol.ior.kit.edu/english/Courses.php.

T Course: Operations Research in Supply Chain Management [T-WIWI-102715]

Responsibility: Stefan Nickel
Contained in: [M-WIWI-101473] Mathematical Programming
[M-WIWI-103289] Stochastic Optimization
[M-WIWI-102805] Service Operations
[M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment is a 120 minutes written examination (according to §4(2), 1 of the examination regulation).
The examination is held in the term of the lecture and the following lecture.

Conditions
None

Recommendations
Basic knowledge as conveyed in the module*Introduction toOperations Research* and in the lectures*Facility Location and Strategic SCM*,*Tactical and operational SCM*is assumed.

Remarks
The course is offered irregularly. Planned lectures for the next three years can be found in the internet at http://dol.ior.kit.edu/english/Courses.php.

T Course: Optimisation and Optimal Control for Differential Equations [T-MATH-105864]

Responsibility:
Contained in: [M-MATH-102899] Optimisation and Optimal Control for Differential Equations

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	1

Conditions
none

T Course: Optimization in Banach Spaces [T-MATH-105893]

Responsibility: Andreas Kirsch
Contained in: [M-MATH-102924] Optimization in Banach Spaces

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Conditions
none

T Course: Optimization under uncertainty [T-WIWI-106545]

Responsibility: Steffen Rebennack
Contained in: [M-WIWI-101413] Applications of Operations Research
[M-WIWI-103289] Stochastic Optimization

ECTS	Recurrence	Exam type	Version
5	Unregelmäßig	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2550464		Vorlesung (V)		Marcel Sinske
WS 18/19	2550465		Übung (Ü)		Christian Füllner
WS 18/19	2550466		Übung (Ü)	2	Christian Füllner

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Conditions
None.

T Course: P&C Insurance Simulation Game [T-WIWI-102797]

Responsibility: Ute Werner
Contained in: [M-WIWI-101469] Insurance Management I

ECTS	Recurrence	Exam type	Version
3	Jedes Wintersemester	Prüfungsleistung anderer Art	1

Learning Control / Examinations
T-WIWI-102797 P+C Insurance Simulation Game will not be offered anymore from winter term 2016/2017 on.

Conditions
None

Recommendations
See German version.

T Course: Panel Data [T-WIWI-103127]

Responsibility: Wolf-Dieter Heller
Contained in: [M-WIWI-101638] Econometrics and Statistics I
[M-WIWI-101639] Econometrics and Statistics II

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2520320		Vorlesung (V)	2	Wolf-Dieter Heller
SS 2018	2520321		Übung (Ü)	2	Wolf-Dieter Heller, Carlo Siebenschuh

Conditions
None

T Course: Parallel Computing [T-MATH-102271]

Responsibility: Mathias Krause, Christian Wieners
Contained in: [M-MATH-101338] Parallel Computing

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

T Course: Parametric Optimization [T-WIWI-102855]

Responsibility: Oliver Stein
Contained in: [M-WIWI-101473] Mathematical Programming

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The examination is held in the semester of the lecture and in the following semester.
Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

Conditions

None

Recommendations

It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Remarks

The lecture is offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).

T Course: Percolation [T-MATH-105869]

Responsibility: Günter Last
Contained in: [M-MATH-102905] Percolation

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

Conditions
none

T Course: Poisson Processes [T-MATH-105922]

Responsibility: Vicky Fasen-Hartmann, Daniel Hug, Günter Last
Contained in: [M-MATH-102922] Poisson Processes

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

Conditions
none

T Course: Portfolio and Asset Liability Management [T-WIWI-103128]

Responsibility: Mher Safarian
Contained in: [M-WIWI-101639] Econometrics and Statistics II

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2520357	Portfolio and Asset Liability Management	Vorlesung (V)	2	Mher Safarian
SS 2018	2520358		Übung (Ü)	2	Mher Safarian

Learning Control / Examinations
The assessment of this course consists of a written examination (following §4(2), 1 SPOs, 180 min.) and of possible additional assignments during the course (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Conditions
None

V Event excerpt: Portfolio and Asset Liability Management (SS 2018)

Aim
Introduction and deepening of various portfolio management techniques in the financial industry.

Content
Portfolio theory: principles of investment, Markowitz- portfolio analysis, Modigliani-Miller theorems and absence of arbitrage, efficient markets, capital asset pricing model (CAPM), multi factorial CAPM, arbitragepricing theory (APT), arbitrage and hedging, multi factorial models, equity-portfolio management, passive strategies, active investment
Asset liability: statistical portfolio analysis in stock allocation, measures of success, dynamic multi seasonal models, models in building scenarios, stochastic programming in bond and liability management, optimal investment strategies, integrated asset liability management

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
To be announced in lecture.
Elective literature:
To be announced in lecture.

T Course: Potential Theory [T-MATH-105850]

Responsibility: Tilo Arens, Frank Hettlich, Andreas Kirsch, Wolfgang Reichel
Contained in: [M-MATH-102879] Potential Theory

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Practical Seminar: Health Care Management (with Case Studies) [T-WIWI-102716]

Responsibility: Stefan Nickel
Contained in: [M-WIWI-102805] Service Operations

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Semester	Prüfungsleistung anderer Art	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550498	Practical seminar: Health Care Management	Veranstaltung (Veranst.)	5	Stefan Nickel, Melanie Reuter-Oppermann, Anne Zander

Learning Control / Examinations
The assessment consists in a case study, the writing of a corresponding paper, and an oral exam (according to §4(2), 2 of the examination regulation).

Conditions
None.

Recommendations
Basic knowledge as conveyed in the module *Introduction toOperations Research* is assumed.

Remarks
The credits have been reduced to 4,5 starting summer term 2016.
The lecture is offered every term.
The planned lectures and courses for the next three years are announced online.

T Course: Practical Seminar: Information Systems and Service Design [T-WIWI-108437]

Responsibility: Norbert Koppenhagen, Alexander Mädche
Contained in: [M-WIWI-104068] Information Systems in Organizations

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2540554	Practical Seminar: Information Systems and Service Design	Seminar (S)	3	Alexander Mädche

Learning Control / Examinations
The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class. Please take into account that, beside the written documentation, also a practical component (e.g. implementation of a prototype) is part of the course. Please examine the course description for the particular tasks. The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class). In the winter terms, the course is only offered as a seminar.

Conditions
None.

Recommendations
Attending the course „Digital Service Design“ is recommended, but not mandatory.

Remarks
The course is held in English.

V Event excerpt: Practical Seminar: Information Systems and Service Design (SS 2018)

Aim
The students will:

- Explore a real-world digital service design challenge
- Learn and apply selected digital service design practices & tools
- Understand capabilities of state-of-the-art digital platforms and realize a digital service prototype

Content

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes

T Course: Predictive Mechanism and Market Design [T-WIWI-102862]

Responsibility: Johannes Philipp Reiß
Contained in: [M-WIWI-101505] Experimental Economics

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Remarks
The course is given every second fall term, e.g., WS2017/18, WS2019/20, ...
The retake exam is given in the summer term subsequent to the fall term where the course (lecture and final exam) is given.

T Course: Pricing [T-WIWI-102883]

Responsibility: Sven Feurer
Contained in: [M-WIWI-101490] Marketing Management

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2572157	Pricing	Vorlesung (V)	2	Sven Feurer
WS 18/19	2572169		Übung (Ü)	1	Wiebke Klingemann

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
None

V Event excerpt: Pricing (WS 18/19)

Aim
See German version.

Content
This course addresses central elements and peculiarities of pricing goods and services. The topics are below others:

- Price demand functions
- Concept of the price elasticity of demand
- Key concepts of behavioral pricing
- Decision-making areas in pricing

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.
Simon, Hermann, Fassnacht, Martin (2008), Preismanagement, 3. Aufl., Wiesbaden.

T Course: Principles of Insurance Management [T-WIWI-102603]

Responsibility: Ute Werner
Contained in: [M-WIWI-101469] Insurance Management I

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung mündlich	1

Learning Control / Examinations

The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).
The examination will be offered latest until summer term 2017 (beginners only).

Conditions

None

Recommendations

None

T Course: Probability Theory and Combinatorial Optimization [T-MATH-105923]

Responsibility: Daniel Hug, Günter Last
Contained in: [M-MATH-102947] Probability Theory and Combinatorial Optimization

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Conditions
none

T Course: Product and Innovation Management [T-WIWI-102812]

Responsibility: Martin Klarmann
Contained in: [M-WIWI-101490] Marketing Management

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2571154	Product and Innovation Marketing	Vorlesung (V)	2	Sven Feurer

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Remarks
For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

V Event excerpt: Product and Innovation Marketing (SS 2018)

Aim
See German version.

Content
This course addresses topics around the management of new as well as existing products. After the foundations of product management, especially the product choice behavior of customers, students get to know in detail different steps of the innovation process. Another section regards the management of the existing product portfolio.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Homburg, Christian (2012), Marketingmanagement, 4. Aufl., Wiesbaden.

T Course: Project Centered Software-Lab [T-MATH-105907]

Responsibility: Gudrun Thäter
Contained in: [M-MATH-102938] Project Centered Software-Lab

ECTS	Language	Exam type	Version
4	englisch	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0161700		Praktikum (P)	4	Fabian Klemens, Mathias Krause, Gudrun Thäter

Conditions
none

T Course: Public Management [T-WIWI-102740]

Responsibility: Berthold Wigger
Contained in: [M-WIWI-101504] Collective Decision Making

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2561127	Public Management	Vorlesung / Übung (VÜ)	3	Berthold Wigger

Learning Control / Examinations
The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

Conditions
None

Recommendations
Basic knowledge of Public Finance is required.

V Event excerpt: Public Management (WS 18/19)

Aim
See German version.

Content
The lecture "Public Management" deals with the economic theory of public sector administration. It is divided into four parts. The first section gives an overview of the legal framework of governmental administration in the Federal Republic of Germany and introduces the classical theory of administration as developed by Weber. Part two studies concepts of public decision-making, which have a significant impact on the operation of public sector administrations and where one focus is on consistency problems of collective decision-making. The third chapter deals with efficiency problems arising in conventionally organized public administrations and companies. X-inefficiency, information and control problems, the isolated consideration of income-spending-relations as well as rent-seeking problems will be considered. In section four the concept of New Public Management, which is a new approach to public sector administration that is mainly based in contract theory, is introduced. Its foundations in institutional economics are developed, with a focus on the specific incentive structures in self-administered administrations. Finally, the achievements of New Public Management approaches are discussed.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Elective literature:

- Damkowski, W. and C. Precht (1995): Public Management; Kohlhammer
- Richter, R. and E.G. Furubotn (2003): Neue Institutionenökonomik; 3rd edition; Mohr
- Schedler, K. and I. Proeller (2003): New Public Management; 2nd edition; UTB
- Mueller, D.C. (2009): Public Choice III; Cambridge University Press
- Wigger, B.U. (2006): Grundzüge der Finanzwissenschaft; 2nd edition; Springer

T Course: Random Graphs [T-MATH-105929]

Responsibility: Matthias Schulte
Contained in: [M-MATH-102951] Random Graphs

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

Conditions
none

T Course: Rational Homotopy Theory [T-MATH-106483]

Responsibility: Manuel Amann, Roman Sauer
Contained in: [M-MATH-103256] Rational Homotopy Theory

ECTS	Recurrence	Exam type	Version
4	Einmalig	Prüfungsleistung mündlich	1

Conditions
Keine

T Course: Risk Communication [T-WIWI-102649]

Responsibility: Ute Werner
Contained in: [M-WIWI-101469] Insurance Management I

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung mündlich	1

Learning Control / Examinations

The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (30 min.) according to Section 4 (2), 2 of the examination regulation.
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

Conditions

None

Recommendations

None

T Course: Ruin theory [T-MATH-108400]

Responsibility: Vicky Fasen-Hartmann
Contained in: [M-MATH-104055] Ruin theory

ECTS	Recurrence	Exam type	Version
4	Unregelmäßig	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0154400		Vorlesung (V)	2	Vicky Fasen-Hartmann
SS 2018	0154410		Übung (Ü)	1	Vicky Fasen-Hartmann

Conditions
none

T Course: Scattering Theory [T-MATH-105855]

Responsibility: Tilo Arens, Frank Hettlich, Andreas Kirsch
Contained in: [M-MATH-102884] Scattering Theory

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

T Course: Selected Issues in Critical Information Infrastructures [T-WIWI-109251]

Responsibility: Ali Sunyaev
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
4	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015). Details will be announced in the respective course.

Conditions
None.

T Course: Semantic Web Technologies [T-WIWI-102874]

Responsibility: York Sure-Vetter
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511310	Semantic Web Technologies	Vorlesung (V)	2	Maribel Acosta Deibe, York Sure-Vetter
SS 2018	2511311	Exercises to Semantic Web Technologies	Übung (Ü)	1	Maribel Acosta Deibe, Tobias Christof Käfer, York Sure-Vetter

Learning Control / Examinations
The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation or of an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Conditions
None

Recommendations
Lectures on Informatics of the Bachelor on Information Management (Semester 1-4) or equivalent are required.

V Event excerpt: Semantic Web Technologies (SS 2018)

Aim
The student

- understands the motivation and foundational ideas behind Semantic Web and Linked Data technologies, and is able to analyse and realise systems
- demonstrates basic competency in the areas of data and system integration on the web
- masters advanced knowledge representation scenarios involving ontologies

Content
The following topics are covered:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

Workload

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preperation and postprocessing: 67.5 hours
- Exam and exam preperation: 37.5 hours

Literature

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web – Grundlagen. Springer, 2008.
- John Domingue, Dieter Fensel, James A. Hendler (Editors). Handbook of Semantic Web Technologies. Springer, 2011.

Additional Literature

- S. Staab, R. Studer (Editors). Handbook on Ontologies. International Handbooks in Information Systems. Springer, 2003.
- Tim Berners-Lee. Weaving the Web. Harper, 1999 geb. 2000 Taschenbuch.
- Ian Jacobs, Norman Walsh. Architecture of the World Wide Web, Volume One. W3C Recommendation 15 December 2004. http://www.w3.org/TR/webarch/
- Dean Allemang. Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL. Morgan Kaufmann, 2008.
- Tom Heath and Chris Bizer. Linked Data: Evolving the Web into a Global Data Space. Synthesis Lectures on the Semantic Web: Theory and Technology, 2011.

T Course: Seminar in Business Administration A (Master) [T-WIWI-103474]

Responsibility: Wolf Fichtner, Hansjörg Fromm, Andreas Geyer-Schulz, Ju-Young Kim, Martin Klarmann, Peter Knauth, Hagen Lindstädt, David Lorenz, Torsten Luedecke, Thomas Lützkendorf, Alexander Mädche, Bruno Neibecker, Stefan Nickel, Petra Nieken, Martin Ruckes, Gerhard Satzger, Frank Schultmann, Thomas Setzer, Orestis Terzidis, Marliese Uhrig-Homburg, Maxim Ulrich, Christof Weinhardt, Marion Weissenberger-Eibl, Ute Werner, Marcus Wouters

Contained in: [M-WIWI-102971] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	deutsch/englisch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2400121	Practical Seminar: Interactive Analytics	Proseminar / Seminar (PS/S)	2	Michael Beigl, Alexander Mädche, Erik Pescara, Peyman Toreini
SS 2018	2530364	Applied Risk and Asset Management	Seminar (S)	2	Maxim Ulrich
SS 2018	2530372	Automated Financial Advisory	Seminar (S)	2	Elmar Jakobs, Maxim Ulrich
SS 2018	2530580	Seminar in Finance (Master, Prof. Uhrig-Homburg)	Seminar (S)	2	Jelena Eberbach, Stefan Fiesel, Michael Hofmann, Marcel Müller, Michael Reichenbacher, Philipp Schuster, Marliese Uhrig-Homburg
SS 2018	2540510		Seminar (S)	2	Andreas Geyer-Schulz
SS 2018	2550493	Hospital Management	Block (B)	2	Martin Ludwig Hansis
SS 2018	2573011	Seminar Human Resource Management	Seminar (S)	2	Mitarbeiter, Petra Nieken
SS 2018	2579904	Seminar Management Accounting	Seminar (S)	2	N.N., Marcus Wouters
SS 2018	2579905	Special Topics in Management Accounting	Seminar (S)	2	Ana Mickovic
SS 2018	2579908	Innovation in Management Accounting	Seminar (S)	2	Markus Kirchberger
SS 2018	2581030		Seminar (S)	2	Fritz Braeuer, Russell McKenna, Jann Michael Weinand
SS 2018	2581977		Seminar (S)	2	Frank Schultmann
WS 18/19	2400013	Seminar: Energy Informatics	Seminar (S)	2	Lukas Barth, Wolf Fichtner, Sascha Gritzbach, Veit Hagenmeyer, Patrick Jochem, Dorothea Wagner, Franziska Wegner, Matthias Wolf
WS 18/19	2500002	Automated Financial Advisory	Seminar (S)	2	Maxim Ulrich

WS 18/19	2530293		Seminar (S)	2	Andreas Benz, Daniel Hoang, Torsten Luedecke, Martin Ruckes, Meik Scholz-Daneshgari, Richard Schubert, Jan-Oliver Strych
WS 18/19	2530374	Applied Risk and Asset Management	Seminar (S)	2	Maxim Ulrich
WS 18/19	2540510	Master Seminar in Information Engineering and Management	Seminar (S)	2	Fabian Ball, Andreas Geyer-Schulz, Victoria-Anne Schweigert, Marvin Schweizer
WS 18/19	2572181		Seminar (S)		Martin Klarmann
WS 18/19	2573010	Seminar Human Resources and Organizations	Seminar (S)	2	Mitarbeiter, Petra Nieken
WS 18/19	2573011	Seminar Human Resource Management	Seminar (S)	2	Mitarbeiter, Petra Nieken
WS 18/19	2581976	Seminar in Production and Operations Management I	Seminar (S)	2	Simon Glöser-Chahoud, Frank Schultmann
WS 18/19	2581977	Seminar in Production and Operations Management II	Seminar (S)	2	Frank Schultmann, Rebekka Volk
WS 18/19	2581978	Seminar in Production and Operations Management III	Seminar (S)	2	Frank Schultmann, Marcus Wiens
WS 18/19	2581980		Seminar (S)	2	Dogan Keles
WS 18/19	2581981		Seminar (S)	2	Armin Ardone

Learning Control / Examinations
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015)consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Seminar Human Resource Management (WS 18/19)

Aim
The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.

- cultivates the discussion of research approaches.

Workload
The total workload for this course is approximately 90 hours.
Lecture 30h
Preparation of lecture 45h
Exam preparation 15h

V Event excerpt: Special Topics in Management Accounting (SS 2018)

Aim
Students
▪ are largely independently able to identify a distinct topic in Management Accounting,
▪ are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
▪ can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources.

Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in four meetings that are spread throughout the semester.
Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.
Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.
Meeting 4: In the third week we are going to present and discuss the final papers.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be announced in the course.

V Event excerpt: Automated Financial Advisory (SS 2018)

Aim
In this seminar students work on issues related to the automatization of risk and investment management applications.

Content
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

V Event excerpt: Master Seminar in Information Engineering and Management (WS 18/19)

Aim
The student is able to

- to perform a literature search for a given topic, to identify, find, value and evaluate the relevant literature.
- to commit to a topic (pr.n., in teamwork); this may include technical conceptinal work and implementation.
- to write his seminar thesis of 15-20 pages in a structured scientific manner.
- to communicate his results in a presentation with discussion afterwards.

Content

The seminar servers on one hand to improve the scientific working skills. On the other hand, the student should work intensively on a given topic and develop a scientific work, that is based on a profound literature research.
The seminar can also be a implementation of software for a scientific problem (e.g. Business Games/dynamic systems) according to the individual focus in the current semester. The software has to be well documented. The written elaboration covers a description and explanation of the software as well as a discussion about limits and extensibility. Furthermore the software must be deployable und shall be presented on the infrastructure stack of the chair. An implementation of a software has to examine the scientific state of the art in a critical way, too.
A concrete description of the current topics is announced in time for the begin of the application stage.

Workload

The total workload for this course is approximately 90 hours (3 ECTS). Depending on the realization of the work, the times may vary. The main focus is always on working independently.

V Event excerpt: Seminar Human Resources and Organizations (WS 18/19)

Aim

The student

- looks critically into current research topics in the fields of Human Resources an Organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Content

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Chair.

Workload

The total workload for this course is approximately 90 hours.
Lecture 30h
Preparation of lecture 45h
Exam preparation 15h

V Event excerpt: Seminar: Energy Informatics (WS 18/19)

Aim

Der/die Studierende besitzt einen vertieften Einblick in Themenbereiche der Energieinformatik und hat grundlegende Kenntnisse in den Bereichen der Modellierung, Simulation und Algorithmen in Energienetzen. Ausgehend von einem vorgegebenen Thema kann er/sie mithilfe einer Literaturrecherche relevante Literatur identifizieren, auffinden, bewerten und schließlich auswerten. Er/sie kann das Thema in den Themenkomplex einordnen und in einen Gesamtzusammenhang bringen.
Er/sie ist in der Lage eine Seminararbeit (und später die Bachelor-/Masterarbeit) mit minimalem Einarbeitungsaufwand anzufertigen und dabei Formatvorgaben zu berücksichtigen, wie sie von allen Verlagen bei der Veröffentlichung von Dokumenten vorgegeben werden. Außerdem versteht er/sie das vorgegebene Thema in Form einer wissenschaftlichen Präsentation auszuarbeiten und kennt Techniken um die vorzustellenden Inhalte auditoriumsgerecht aufzuarbeiten und vorzutragen. Somit besitzt er/sie die Kenntnis wissenschaftliche Ergebnisse der Recherche in schriftlicher Form derart zu präsentieren, wie es in wissenschaftlichen Publikationen der Fall ist.

Content

Energieinformatik ist eine junges Forschungsgebiet, welches verschiedene Bereiche ausserhalb der Informatik beinhaltet wie der Wirtschaftswissenschaft, Elektrotechnik und Rechtswissenschaften. Bedingt durch die Energiewende wird vermehrt Strom aus erneuerbaren Erzeugern in das Netz eingespeist. Der Trend hin zu dezentralen und volatilen Stromerzeugung führt jedoch schon heute zu Engpässen in Stromnetzen, da diese für ein bidirektionales Szenario nicht ausgelegt wurden. Mithilfe der Energieinformatik und der dazugehörigen Vernetzung der verschiedenen Kompetenzen soll eine intelligente Steuerung der Netzinfrastruktur—von Stromverbrauchern, -erzeugern, -speichern und Netzkomponenten—zu einer umweltfreundlichen, nachhaltigen, effizienten und verlässlichen Energieversorgung beitragen.
Daher sollen im Rahmen des Seminars „Seminar: Energieinformatik“, unterschiedliche Algorithmen, Simulationen und Modellierungen bzgl. ihrer Vor- und Nachteile in den verschiedenen Bereichen der Netzinfrastruktur untersucht werden.

Workload
4 LP entspricht ca. 120 Stunden
ca. 21 Std. Besuch des Seminars,
ca. 45 Std. Analyse und Bearbeitung des Themas,
ca. 27 Std. Vorbereitung und Erstellung der Präsentation, und
ca. 27 Std. Schreiben der Ausarbeitung.

V Event excerpt: Seminar in Finance (Master, Prof. Uhrig-Homburg) (SS 2018)

Aim
The student gets in touch with scientific work. Through profound working on a specific scientific topic the student is meant to learn the foundations of scientific research and reasoning in particular in finance.
Through the presentations in this seminar the student becomes familiar with the fundamental techniques for presentations and foundations of scientific reasoning. In addition, the student earns rhetorical skills.

Content
Within this seminar different topics of current concern are treated. These topics have their foundations in the contents of certain lectures.
The topics of the seminar are published on the website of the involved finance chairs at the end of the foregoing semester.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be announced at the end of the foregoing semester.

V Event excerpt: Automated Financial Advisory (WS 18/19)

Aim
In this seminar students work on issues related to the automatization of risk and investment management applications.

Content
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

V Event excerpt: Hospital Management (SS 2018)

Aim
The student

- knows the scope of duties and decisions of a hospital manager and
- is able to give profound guidance.

Content
The seminar 'Hospital Management' presents internal organization structures, work conditions and work environments at the example of hospitals und relates this to common and expected conditions of other service industries.
Covered topics include normative environment, intra-organizational structure, personnel management, quality, external networking and market appearance. The course consists of two full-day sessions.

Workload
The total workload for this course is approximately 90 hours.

V Event excerpt: Seminar Management Accounting (SS 2018)

Aim
Students

- are largely independently able to identify a distinct topic in Management Accounting,
- are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources.

Content

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.

Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.

Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.

Meeting 4: In the third week we are going to present and discuss the final papers.

Workload

The total workload for this course is approximately 90 hours. For further information see German version.

Literature

Will be announced in the course.

V Event excerpt: (WS 18/19)

Aim

Students

- can exploit a literature field systematically
- are able to write an academic paper in a formally correct way
- can assess the relevance and quality of sources
- are able to get an overview of sources very quickly
- know how to find relevant sources for a literature field
- are capable to write a convincing outline
- know how to categorize a subject under a research field
- understand how to systematize literature fields theoretically and empirically with the help of literature tables
- can identify the most important findings in a huge number of sources
- are able to present a research field
- can discuss the theoretical and practical implications of a topic
- are capable to identify interesting research gaps

Content

The seminary teaches students to gain a systematic overview of a field of literature in Marketing - an important prerequisite for a successful master thesis. Central aspects are identification of relevant literature sources, systematization of the field, working out central insights, writing comprehensively, and identification of research gaps.

Workload

The total workload for this course is approximately 90 hours. For further information see German version.

Literature

will be announced in the seminary.

T Course: Seminar in Business Administration B (Master) [T-WIWI-103476]

Responsibility: Wolf Fichtner, Hansjörg Fromm, Andreas Geyer-Schulz, Ju-Young Kim, Martin Klarmann, Peter Knauth, Hagen Lindstädt, David Lorenz, Torsten Luedecke, Thomas Lützkendorf, Alexander Mädche, Bruno Neibecker, Stefan Nickel, Petra Nieken, Martin Ruckes, Gerhard Satzger, Frank Schultmann, Thomas Setzer, Orestis Terzidis, Marliese Uhrig-Homburg, Maxim Ulrich, Christof Weinhardt, Marion Weissenberger-Eibl, Ute Werner, Marcus Wouters

Contained in: [M-WIWI-102972] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	deutsch/englisch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2530364	Applied Risk and Asset Management	Seminar (S)	2	Maxim Ulrich
SS 2018	2530372	Automated Financial Advisory	Seminar (S)	2	Elmar Jakobs, Maxim Ulrich
SS 2018	2530580	Seminar in Finance (Master, Prof. Uhrig-Homburg)	Seminar (S)	2	Jelena Eberbach, Stefan Fiesel, Michael Hofmann, Marcel Müller, Michael Reichenbacher, Philipp Schuster, Marliese Uhrig-Homburg
SS 2018	2540510		Seminar (S)	2	Andreas Geyer-Schulz
SS 2018	2550493	Hospital Management	Block (B)	2	Martin Ludwig Hansis
SS 2018	2573011	Seminar Human Resource Management	Seminar (S)	2	Mitarbeiter, Petra Nieken
SS 2018	2579904	Seminar Management Accounting	Seminar (S)	2	N.N., Marcus Wouters
SS 2018	2579905	Special Topics in Management Accounting	Seminar (S)	2	Ana Mickovic
SS 2018	2579908	Innovation in Management Accounting	Seminar (S)	2	Markus Kirchberger
SS 2018	2581030		Seminar (S)	2	Fritz Braeuer, Russell McKenna, Jann Michael Weinand
SS 2018	2581977		Seminar (S)	2	Frank Schultmann
WS 18/19	2400013	Seminar: Energy Informatics	Seminar (S)	2	Lukas Barth, Wolf Fichtner, Sascha Gritzbach, Veit Hagenmeyer, Patrick Jochem, Dorothea Wagner, Franziska Wegner, Matthias Wolf
WS 18/19	2500002	Automated Financial Advisory	Seminar (S)	2	Maxim Ulrich
WS 18/19	2530293		Seminar (S)	2	Andreas Benz, Daniel Hoang, Torsten Luedecke, Martin Ruckes, Meik Scholz-Daneshgari, Richard Schubert, Jan-Oliver Strych

WS 18/19	2530374	Applied Risk and Asset Management	Seminar (S)	2	Maxim Ulrich
WS 18/19	2540510	Master Seminar in Information Engineering and Management	Seminar (S)	2	Fabian Ball, Andreas Geyer-Schulz, Victoria-Anne Schweigert, Marvin Schweizer
WS 18/19	2572181		Seminar (S)		Martin Klarmann
WS 18/19	2573010	Seminar Human Resources and Organizations	Seminar (S)	2	Mitarbeiter, Petra Nieken
WS 18/19	2573011	Seminar Human Resource Management	Seminar (S)	2	Mitarbeiter, Petra Nieken
WS 18/19	2581976	Seminar in Production and Operations Management I	Seminar (S)	2	Simon Glöser-Chahoud, Frank Schultmann
WS 18/19	2581977	Seminar in Production and Operations Management II	Seminar (S)	2	Frank Schultmann, Rebekka Volk
WS 18/19	2581978	Seminar in Production and Operations Management III	Seminar (S)	2	Frank Schultmann, Marcus Wiens
WS 18/19	2581980		Seminar (S)	2	Dogan Keles
WS 18/19	2581981		Seminar (S)	2	Armin Ardone

Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Seminar Human Resource Management (WS 18/19)

Aim
The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload
The total workload for this course is approximately 90 hours.
Lecture 30h
Preparation of lecture 45h

Exam preparation 15h

V Event excerpt: Special Topics in Management Accounting (SS 2018)

Aim
Students

- are largely independently able to identify a distinct topic in Management Accounting,
- are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources.

Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in four meetings that are spread throughout the semester.
Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.
Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.
Meeting 4: In the third week we are going to present and discuss the final papers.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be announced in the course.

V Event excerpt: Automated Financial Advisory (SS 2018)

Aim
In this seminar students work on issues related to the automatization of risk and investment management applications.

Content
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

V Event excerpt: Master Seminar in Information Engineering and Management (WS 18/19)

Aim
The student is able to

- to perform a literature search for a given topic, to identify, find, value and evaluate the relevant literature.
- to commit to a topic (pr.n., in teamwork); this may include technical conceptinal work and implementation.
- to write his seminar thesis of 15-20 pages in a structured scientific manner.
- to communicate his results in a presentation with discussion afterwards.

Content
The seminar servers on one hand to improve the scientific working skills. On the other hand, the student should work intensively on a given topic and develop a scientific work, that is based on a profound literature research.
The seminar can also be a implementation of software for a scientific problem (e.g. Business Games/dynamic systems) according to the individual focus in the current semester. The software has to be well documented. The written elaboration covers a description and explanation of the software as well as a discussion about limits and extensibility. Furthermore

the software must be deployable und shall be presented on the infrastructure stack of the chair. An implementation of a software has to examine the scientific state of the art in a critical way, too.
A concrete description of the current topics is announced in time for the begin of the application stage.

Workload
The total workload for this course is approximately 90 hours (3 ECTS). Depending on the realization of the work, the times may vary. The main focus is always on working independently.

V Event excerpt: Seminar Human Resources and Organizations (WS 18/19)

Aim
The student

- looks critically into current research topics in the fields of Human Resources an Organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Content
The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Chair.

Workload
The total workload for this course is approximately 90 hours.
Lecture 30h
Preparation of lecture 45h
Exam preparation 15h

V Event excerpt: Seminar: Energy Informatics (WS 18/19)

Aim
Der/die Studierende besitzt einen vertieften Einblick in Themenbereiche der Energieinformatik und hat grundlegende Kenntnisse in den Bereichen der Modellierung, Simulation und Algorithmen in Energienetzen. Ausgehend von einem vorgegebenen Thema kann er/sie mithilfe einer Literaturrecherche relevante Literatur identifizieren, auffinden, bewerten und schließlich auswerten. Er/sie kann das Thema in den Themenkomplex einordnen und in einen Gesamtzusammenhang bringen.
Er/sie ist in der Lage eine Seminararbeit (und später die Bachelor-/Masterarbeit) mit minimalem Einarbeitungsaufwand anzufertigen und dabei Formatvorgaben zu berücksichtigen, wie sie von allen Verlagen bei der Veröffentlichung von Dokumenten vorgegeben werden. Außerdem versteht er/sie das vorgegebene Thema in Form einer wissenschaftlichen Präsentation auszuarbeiten und kennt Techniken um die vorzustellenden Inhalte auditoriumsgerecht aufzuarbeiten und vorzutragen. Somit besitzt er/sie die Kenntnis wissenschaftliche Ergebnisse der Recherche in schriftlicher Form derart zu präsentieren, wie es in wissenschaftlichen Publikationen der Fall ist.

Content
Energieinformatik ist eine junges Forschungsgebiet, welches verschiedene Bereiche ausserhalb der Informatik beinhaltet wie der Wirtschaftswissenschaft, Elektrotechnik und Rechtswissenschaften. Bedingt durch die Energiewende wird vermehrt Strom aus erneuerbaren Erzeugern in das Netz eingespeist. Der Trend hin zu dezentralen und volatilen Stromerzeugung führt jedoch schon heute zu Engpässen in Stromnetzen, da diese für ein bidirektionales Szenario nicht ausgelegt wurden. Mithilfe der Energieinformatik und der dazugehörigen Vernetzung der verschiedenen Kompetenzen soll eine intelligente Steuerung der Netzinfrastruktur—von Stromverbrauchern, -erzeugern, -speichern und Netzkomponenten—zu einer umweltfreundlichen, nachhaltigen, effizienten und verlässlichen Energieversorgung beitragen.
Daher sollen im Rahmen des Seminars „Seminar: Energieinformatik“, unterschiedliche Algorithmen, Simulationen und Modellierungen bzgl. ihrer Vor- und Nachteile in den verschiedenen Bereichen der Netzinfrastruktur untersucht werden.

Workload
4 LP entspricht ca. 120 Stunden
ca. 21 Std. Besuch des Seminars,
ca. 45 Std. Analyse und Bearbeitung des Themas,
ca. 27 Std. Vorbereitung und Erstellung der Präsentation, und

ca. 27 Std. Schreiben der Ausarbeitung.

V Event excerpt: Seminar in Finance (Master, Prof. Uhrig-Homburg) (SS 2018)

Aim

The student gets in touch with scientific work. Through profound working on a specific scientific topic the student is meant to learn the foundations of scientific research and reasoning in particular in finance.
Through the presentations in this seminar the student becomes familiar with the fundamental techniques for presentations and foundations of scientific reasoning. In addition, the student earns rhetorical skills.

Content

Within this seminar different topics of current concern are treated. These topics have their foundations in the contents of certain lectures.
The topics of the seminar are published on the website of the involved finance chairs at the end of the foregoing semester.

Workload

The total workload for this course is approximately 90 hours. For further information see German version.

Literature

Will be announced at the end of the foregoing semester.

V Event excerpt: Automated Financial Advisory (WS 18/19)

Aim

In this seminar students work on issues related to the automatization of risk and investment management applications.

Content

At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload

The total workload for this course is approximately 90 hours.

Literature

Literature will be distributed during the first lecture.

V Event excerpt: Hospital Management (SS 2018)

Aim

The student

- knows the scope of duties and decisions of a hospital manager and
- is able to give profound guidance.

Content

The seminar 'Hospital Management' presents internal organization structures, work conditions and work environments at the example of hospitals und relates this to common and expected conditions of other service industries.
Covered topics include normative environment, intra-organizational structure, personnel management, quality, external networking and market appearance. The course consists of two full-day sessions.

Workload

The total workload for this course is approximately 90 hours.

V Event excerpt: Seminar Management Accounting (SS 2018)

Aim

Students
- are largely independently able to identify a distinct topic in Management Accounting,
- are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources.

Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.
Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.
Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.
Meeting 4: In the third week we are going to present and discuss the final papers.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Will be announced in the course.

V Event excerpt: (WS 18/19)

Aim
Students

- can exploit a literature field systematically
- are able to write an academic paper in a formally correct way
- can assess the relevance and quality of sources
- are able to get an overview of sources very quickly
- know how to find relevant sources for a literature field
- are capable to write a convincing outline
- know how to categorize a subject under a research field
- understand how to systematize literature fields theoretically and empirically with the help of literature tables
- can identify the most important findings in a huge number of sources
- are able to present a research field
- can discuss the theoretical and practical implications of a topic
- are capable to identify interesting research gaps

Content
The seminary teaches students to gain a systematic overview of a field of literature in Marketing - an important prerequisite for a successful master thesis. Central aspects are identification of relevant literature sources, systematization of the field, working out central insights, writing comprehensively, and identification of research gaps.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
will be announced in the seminary.

T Course: Seminar in Economics A (Master) [T-WIWI-103478]

Responsibility: Johannes Brumm, Jan Kowalski, Kay Mitusch, Ingrid Ott, Clemens Puppe, Johannes Philipp Reiß, Nora Szech, Berthold Wigger

Contained in: [M-WIWI-102971] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	deutsch/englisch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2521310	Advanced Topics in Econometrics	Seminar (S)	2	Rebekka Buse, Chong Liang, Melanie Schienle
SS 2018	2560282		Seminar (S)	2	Assistenten, Ingrid Ott
WS 18/19	2512312	Cooperation seminar: Innovative applications on single board computers as well as their economic relevance	Seminar / Praktikum (S/P)	3	David Bälz, Ingrid Ott, York Sure-Vetter, Tobias Weller
WS 18/19	2560140	Topics on Political Economics	Seminar (S)	2	David Huber, Nora Szech
WS 18/19	2560141		Seminar (S)	2	Jeroen Jannis Engel, Nora Szech
WS 18/19	2560400	Seminar in Macroeconomics	Seminar (S)	2	Johannes Brumm, Christopher Krause, Luca Pegorari
WS 18/19	2561208		Seminar (S)	1	Eckhard Szimba

Learning Control / Examinations

The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions

None.

Recommendations

See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Cooperation seminar: Innovative applications on single board computers as well as their economic relevance (WS 18/19)

Content

Topics of interest include, but are not limited to:

- Smart Home Applications
- Environmental measurements
- Gesture control
- Security systems

V Event excerpt: Topics on Political Economics (WS 18/19)

Aim
The student develops an own idea for an economic experiment in this research direction.

Workload
About 90 hours.

T Course: Seminar in Economics B (Master) [T-WIWI-103477]

Responsibility: Johannes Brumm, Jan Kowalski, Kay Mitusch, Ingrid Ott, Clemens Puppe, Johannes Philipp Reiß, Nora Szech, Berthold Wigger
Contained in: [M-WIWI-102972] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	deutsch/englisch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2521310	Advanced Topics in Econometrics	Seminar (S)	2	Rebekka Buse, Chong Liang, Melanie Schienle
SS 2018	2560282		Seminar (S)	2	Assistenten, Ingrid Ott
WS 18/19	2512312	Cooperation seminar: Innovative applications on single board computers as well as their economic relevance	Seminar / Praktikum (S/P)	3	David Bälz, Ingrid Ott, York Sure-Vetter, Tobias Weller
WS 18/19	2560140	Topics on Political Economics	Seminar (S)	2	David Huber, Nora Szech
WS 18/19	2560141		Seminar (S)	2	Jeroen Jannis Engel, Nora Szech
WS 18/19	2560400	Seminar in Macroeconomics	Seminar (S)	2	Johannes Brumm, Christopher Krause, Luca Pegorari
WS 18/19	2561208		Seminar (S)	1	Eckhard Szimba

Learning Control / Examinations
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015)consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Cooperation seminar: Innovative applications on single board computers as well as their economic relevance (WS 18/19)

Content
Topics of interest include, but are not limited to:

- Smart Home Applications
- Environmental measurements
- Gesture control
- Security systems

V Event excerpt: Topics on Political Economics (WS 18/19)

Aim
The student develops an own idea for an economic experiment in this research direction.

Workload
About 90 hours.

T Course: Seminar in Informatics A (Master) [T-WIWI-103479]

Responsibility: Andreas Oberweis, Harald Sack, Ali Sunyaev, York Sure-Vetter, Melanie Volkamer, Johann Marius Zöllner

Contained in: [M-WIWI-102973] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	deutsch/englisch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2512300		Seminar / Praktikum (S/P)	3	Aditya Mogadala, Achim Rettinger, York Sure-Vetter, Steffen Thoma
SS 2018	2513200		Seminar (S)	2	Sascha Alpers, Andreas Fritsch, Andreas Oberweis, Oliver Raabe, Gunther Schiefer, Melanie Volkamer, Manuela Wagner
SS 2018	2513300	Technology-enhanced Learning	Seminar (S)	2	Jürgen Beyerer, Klemens Böhm, Matthias Frank, Gerd Gidion, Martin Mandausch, Wolfgang Roller, Alexander Streicher, York Sure-Vetter, Daniel Szentes
SS 2018	2513306	Data Science & Real-time Big Data Analytics	Seminar / Praktikum (S/P)	2	Dominik Riemer, Suad Sejdovic, York Sure-Vetter
SS 2018	2513400		Seminar (S)	2	Sebastian Lins, Ali Sunyaev, Scott Thiebes
SS 2018	2595470	Seminar Service Science, Management & Engineering	Seminar (S)	2	Wolf Fichtner, Hansjörg Fromm, Stefan Nickel, Gerhard Satzger, York Sure-Vetter, Christof Weinhardt
WS 18/19	2400125		Seminar (S)	2	Franziska Boehm, Nina Gerber, Melanie Volkamer
WS 18/19	2512301	Linked Data and the Semantic Web	Seminar / Praktikum (S/P)	3	Maribel Acosta Deibe, Lars Heling, Tobias Christof Käfer, York Sure-Vetter, Tobias Weller
WS 18/19	2512311	Data Science with Open Data	Seminar / Praktikum (S/P)	3	Matthias Frank, York Sure-Vetter

WS 18/19	2512312	Cooperation seminar: Innovative applications on single board computers as well as their economic relevance	Seminar / Praktikum (S/P)	3	David Bälz, Ingrid Ott, York Sure-Vetter, Tobias Weller
WS 18/19	2513400		Seminar (S)	2	Sebastian Lins, Ali Sunyaev, Scott Thiebes
WS 18/19	2595470	Seminar Service Science, Management & Engineering	Seminar (S)	2	Wolf Fichtner, Hansjörg Fromm, Stefan Nickel, Gerhard Satzger, York Sure-Vetter, Christof Weinhardt

Learning Control / Examinations
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015)consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
Placeholder for seminars offered by the Institute AIFB.
Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Linked Data and the Semantic Web (WS 18/19)

Workload
Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

V Event excerpt: Seminar Service Science, Management & Engineering (WS 18/19)

Aim
The student

- illustrates and evaluates classic and current research questions in service science, management and engineering,
- applies models and techniques in service science, also with regard to their applicability in practical cases,
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Content
Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.
See the KSRI website for more information about this seminar: www.ksri.kit.edu

Workload
The total workload for this course is approximately 120 hours. For further information see German version.

Literature
The student will receive the necessary literature for his research topic.

V Event excerpt: Technology-enhanced Learning (SS 2018)

Content
Die Liste der Seminarthemen finden Sie unter https://portal.wiwi.kit.edu/ys/1868

Literature
Werden im Seminar bekanntgegeben

V Event excerpt: (SS 2018)

Content
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

Literature
Detailed references are indicated together with the respective subjects. For general background information look up the following textbooks:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

V Event excerpt: Cooperation seminar: Innovative applications on single board computers as well as their economic relevance (WS 18/19)

Content
Topics of interest include, but are not limited to:

- Smart Home Applications
- Environmental measurements
- Gesture control
- Security systems

V Event excerpt: (WS 18/19)

Aim
Students (1) independently analyze current questions in the field of information systems; (2) work on the respective scientific question with recognized scientific methods and write a seminar thesis on it; (3) can combine already learned theoretical and practical lecture contents of the respective question.

T Course: Seminar in Informatics B (Master) [T-WIWI-103480]

Responsibility: Andreas Oberweis, Harald Sack, Ali Sunyaev, York Sure-Vetter, Melanie Volkamer, Johann Marius Zöllner

Contained in: [M-WIWI-102974] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	deutsch/englisch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2512300		Seminar / Praktikum (S/P)	3	Aditya Mogadala, Achim Rettinger, York Sure-Vetter, Steffen Thoma
SS 2018	2513200		Seminar (S)	2	Sascha Alpers, Andreas Fritsch, Andreas Oberweis, Oliver Raabe, Gunther Schiefer, Melanie Volkamer, Manuela Wagner
SS 2018	2513300	Technology-enhanced Learning	Seminar (S)	2	Jürgen Beyerer, Klemens Böhm, Matthias Frank, Gerd Gidion, Martin Mandausch, Wolfgang Roller, Alexander Streicher, York Sure-Vetter, Daniel Szentes
SS 2018	2513306	Data Science & Real-time Big Data Analytics	Seminar / Praktikum (S/P)	2	Dominik Riemer, Suad Sejdovic, York Sure-Vetter
SS 2018	2513400		Seminar (S)	2	Sebastian Lins, Ali Sunyaev, Scott Thiebes
SS 2018	2595470	Seminar Service Science, Management & Engineering	Seminar (S)	2	Wolf Fichtner, Hansjörg Fromm, Stefan Nickel, Gerhard Satzger, York Sure-Vetter, Christof Weinhardt
WS 18/19	2400125		Seminar (S)	2	Franziska Boehm, Nina Gerber, Melanie Volkamer
WS 18/19	2512301	Linked Data and the Semantic Web	Seminar / Praktikum (S/P)	3	Maribel Acosta Deibe, Lars Heling, Tobias Christof Käfer, York Sure-Vetter, Tobias Weller
WS 18/19	2512311	Data Science with Open Data	Seminar / Praktikum (S/P)	3	Matthias Frank, York Sure-Vetter

WS 18/19	2512312	Cooperation seminar: Innovative applications on single board computers as well as their economic relevance	Seminar / Praktikum (S/P)	3	David Bälz, Ingrid Ott, York Sure-Vetter, Tobias Weller
WS 18/19	2513400		Seminar (S)	2	Sebastian Lins, Ali Sunyaev, Scott Thiebes
WS 18/19	2595470	Seminar Service Science, Management & Engineering	Seminar (S)	2	Wolf Fichtner, Hansjörg Fromm, Stefan Nickel, Gerhard Satzger, York Sure-Vetter, Christof Weinhardt

Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
Placeholder for seminars offered by the Institute AIFB.
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Linked Data and the Semantic Web (WS 18/19)

Workload
Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

V Event excerpt: Seminar Service Science, Management & Engineering (WS 18/19)

Aim
The student

- illustrates and evaluates classic and current research questions in service science, management and engineering,
- applies models and techniques in service science, also with regard to their applicability in practical cases,
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Content
Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.
See the KSRI website for more information about this seminar: www.ksri.kit.edu

Workload
The total workload for this course is approximately 120 hours. For further information see German version.

Literature
The student will receive the necessary literature for his research topic.

V Event excerpt: Technology-enhanced Learning (SS 2018)

Content
Die Liste der Seminarthemen finden Sie unter https://portal.wiwi.kit.edu/ys/1868

Literature
Werden im Seminar bekanntgegeben

V Event excerpt: (SS 2018)

Content
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

Literature
Detailed references are indicated together with the respective subjects. For general background information look up the following textbooks:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

V Event excerpt: Cooperation seminar: Innovative applications on single board computers as well as their economic relevance (WS 18/19)

Content
Topics of interest include, but are not limited to:

- Smart Home Applications
- Environmental measurements
- Gesture control
- Security systems

V Event excerpt: (WS 18/19)

Aim
Students (1) independently analyze current questions in the field of information systems; (2) work on the respective scientific question with recognized scientific methods and write a seminar thesis on it; (3) can combine already learned theoretical and practical lecture contents of the respective question.

T Course: Seminar in Operations Research A (Master) [T-WIWI-103481]

Responsibility: Stefan Nickel, Steffen Rebennack, Oliver Stein
Contained in: [M-WIWI-102973] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550132		Seminar (S)	2	Robert Mohr, Christoph Neumann, Oliver Stein
SS 2018	2550473		Seminar (S)	2	Peter Kirst, Steffen Rebennack
SS 2018	2550491	Seminar: Recent Topics in OR	Block (B)		Mitarbeiter, Stefan Nickel
WS 18/19	2550491	Seminar: Recent Topics in OR	Seminar (S)		Mitarbeiter, Stefan Nickel

Learning Control / Examinations
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Seminar: Recent Topics in OR (WS 18/19)

Aim
The student

- illustrates and evaluates classic and current research questions in discrete optimization,
- applies optimization models and algorithms in discrete optimization, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management),
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Content
The topics of the seminar will be announced at the beginning of the term in a preliminaty meeting. Dates will be announced on the internet.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Literature and relevant sources will be announced at the beginning of the seminar.

T Course: Seminar in Operations Research B (Master) [T-WIWI-103482]

Responsibility: Stefan Nickel, Steffen Rebennack, Oliver Stein
Contained in: [M-WIWI-102974] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550132		Seminar (S)	2	Robert Mohr, Christoph Neumann, Oliver Stein
SS 2018	2550473		Seminar (S)	2	Peter Kirst, Steffen Rebennack
SS 2018	2550491	Seminar: Recent Topics in OR	Block (B)		Mitarbeiter, Stefan Nickel
WS 18/19	2550491	Seminar: Recent Topics in OR	Seminar (S)		Mitarbeiter, Stefan Nickel

Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

V Event excerpt: Seminar: Recent Topics in OR (WS 18/19)

Aim
The student

- illustrates and evaluates classic and current research questions in discrete optimization,
- applies optimization models and algorithms in discrete optimization, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management),
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Content

The topics of the seminar will be announced at the beginning of the term in a preliminaty meeting. Dates will be announced on the internet.

Workload

The total workload for this course is approximately 90 hours. For further information see German version.

Literature

Literature and relevant sources will be announced at the beginning of the seminar.

T Course: Seminar in Statistics A (Master) [T-WIWI-103483]

Responsibility: Oliver Grothe, Melanie Schienle
Contained in: [M-WIWI-102971] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	englisch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2521310	Advanced Topics in Econometrics	Seminar (S)	2	Rebekka Buse, Chong Liang, Melanie Schienle

Learning Control / Examinations
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015)consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

T Course: Seminar in Statistics B (Master) [T-WIWI-103484]

Responsibility: Oliver Grothe, Melanie Schienle
Contained in: [M-WIWI-102972] Seminar

ECTS	Language	Recurrence	Exam type	Version
3	englisch	Jedes Semester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2521310	Advanced Topics in Econometrics	Seminar (S)	2	Rebekka Buse, Chong Liang, Melanie Schienle

Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

Conditions
None.

Recommendations
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Remarks
The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.
The available places are listed on the internet: https://portal.wiwi.kit.edu.

T Course: Seminar Mathematics [T-MATH-105686]

Responsibility:
Contained in: [M-MATH-102730] Seminar

ECTS	Exam type	Version
3	Studienleistung	1

T Course: Service Oriented Computing [T-WIWI-105801]

Responsibility: York Sure-Vetter
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
5	Jedes Sommersemester	Prüfungsleistung schriftlich	2

Learning Control / Examinations
Please note that the exam will be offered to first-time applicants in the winter semester 2018/2019. A last examination possibility exists in the summer semester 2019 (only for repeaters).
The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation or of an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.

Conditions
None

T Course: Simulation of Stochastic Systems [T-WIWI-106552]

Responsibility: Oliver Grothe, Steffen Rebennack
Contained in: [M-WIWI-103289] Stochastic Optimization

ECTS	Recurrence	Exam type	Version
4.5	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Conditions
None.

T Course: Smart Energy Infrastructure [T-WIWI-107464]

Responsibility: Armin Ardone, Andrej Marko Pustisek
Contained in: [M-WIWI-101452] Energy Economics and Technology

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2581023		Vorlesung (V)	2	Armin Ardone, Andrej Marko Pustisek

Learning Control / Examinations
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Conditions
None.

Remarks
New course starting winter term 2017/2018.

V Event excerpt: (WS 18/19)

Aim
Der/die Studierende

- kennt die Grundzüge von Infrastruktur im Kontext von Energietransport (insbesondere von Gas- und Stromnetzen sowie Erdgasspeichern) und
- versteht deren (energie-)wirtschaftliche Bedeutung.

Workload
Gesamtaufwand bei 3 Leistungspunkten: ca. 90 Stunden
Präsenzzeit: 30 Stunden
Selbststudium: 60 Stunden

T Course: Smart Grid Applications [T-WIWI-107504]

Responsibility: Johannes Gärttner, Christof Weinhardt
Contained in: [M-WIWI-103720] eEnergy: Markets, Services and Systems

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2540452	Smart Grid Applications	Vorlesung (V)	2	Philipp Staudt, Clemens van Dinther
WS 18/19	2540453	Übung zu Smart Grid Applications	Vorlesung (V)	2	Esther Marie Mengelkamp, Philipp Staudt

Learning Control / Examinations
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Conditions
None

Recommendations
None

Remarks
The lecture will be read for the first time in winter term 2018/19.

T Course: Sobolev Spaces [T-MATH-105896]

Responsibility: Andreas Kirsch
Contained in: [M-MATH-102926] Sobolev Spaces

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

T Course: Social Choice Theory [T-WIWI-102859]

Responsibility: Clemens Puppe
Contained in: [M-WIWI-101500] Microeconomic Theory
[M-WIWI-101504] Collective Decision Making

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2520537	Social Choice Theory	Vorlesung (V)	2	Michael Müller, Clemens Puppe
SS 2018	2520539		Übung (Ü)	1	Michael Müller, Clemens Puppe

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None

V Event excerpt: Social Choice Theory (SS 2018)

Aim
The student should acquire knowledge of formal theories of collective decision making and learn to apply them to real life situations.

Content
The course provides a comprehensive treatment of preference and judgement aggregation, including proofs of general results that have Arrow's famous impossibility theorem and Gibbard's oligarchy theorem as corollaries. The second part of the course is devoted to voting theory. Among other things, we prove the Gibbard-Satterthwaite theorem.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Main texts:

- Hervé Moulin: Axioms of Cooperative Decision Making, Cambridge University Press, 1988
- Christian List and Clemens Puppe: Judgement Aggregation. A survey, in: Handbook of rational & social choice, P.Anand, P.Pattanaik, C.Puppe (Eds.), Oxford University Press 2009.

Secondary texts:

- Amartya Sen: Collective Choice and Social Welfare, Holden-Day, 1970
- Wulf Gaertner: A Primer in Social Choice Theory, revised edition, Oxford University Press, 2009
- Wulf Gaertner: Domain Conditions in Social Choice Theory, Oxford University Press, 2001

T Course: Sociotechnical Information Systems Development [T-WIWI-109249]

Responsibility: Ali Sunyaev
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
4	deutsch/englisch	Jedes Semester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2512400		Praktikum (P)		Theresa Kromat, Ali Sunyaev

Learning Control / Examinations
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of an implementation and a final thesis documenting the development and use of the application.

Conditions
None.

V Event excerpt: (WS 18/19)

Aim

- Independent and self-organized realization of a software development project
- Evaluation and selection of suitable development tools and methods
- Application of modern software development methods
- Planning and execution of different development tasks: requirements assessment, system design, implementation, and quality assurance
- Project documentation
- Presentation of project results in an comprehensible and structured form

Workload
4 ECTS = approx. 120 h

T Course: Software Quality Management [T-WIWI-102895]

Responsibility: Andreas Oberweis
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511208	Software Quality Management	Vorlesung (V)	2	Andreas Oberweis
SS 2018	2511209		Übung (Ü)	1	Susan Hickl, Andreas Oberweis

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Conditions
None

Remarks
This course was formely named "Software Technology: Quality Management".

V Event excerpt: Software Quality Management (SS 2018)

Aim
Students

- explain the relevant quality models,
- apply methods to evaluate the software quality and evaluate the results,
- know the mail models of sofware certification, compare and evaluate these models,
- write scientific theses in the area of software quality management and find own solutions for given problems.

Content
This lecture imparts fundamentals of active software quality management (quality planning, quality testing, quality control, quality assurance) and illustrates them with concrete examples, as currently applied in industrial software development. Keywords of the lecture content are: software and software quality, process models, software process quality, ISO 9000-3, CMM(I), BOOTSTRAP, SPICE, software tests.

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam 1h

Total: 150h

Literature

- Helmut Balzert: Lehrbuch der Software-Technik. Spektrum-Verlag 2008

- Peter Liggesmeyer: Software-Qualität, Testen, Analysieren und Verifizieren von Software. Spektrum Akademischer Verlag 2002
- Mauro Pezzè, Michal Young: Software testen und analysieren. Oldenbourg Verlag 2009

Further literature is given in lectures.

T Course: Spatial Economics [T-WIWI-103107]

Responsibility: Ingrid Ott
Contained in: [M-WIWI-101496] Growth and Agglomeration

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required. The attendance of the course Introduction to economic policy [2560280] is recommended.

Remarks
Due to the research semester of Prof. Dr. Ingrid Ott, the course is not offered in the winter term 2018/19.

T Course: Spatial Stochastics [T-MATH-105867]

Responsibility: Daniel Hug, Günter Last
Contained in: [M-MATH-102903] Spatial Stochastics

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0105600		Vorlesung (V)	4	Günter Last
WS 18/19	0105700		Übung (Ü)	2	Günter Last

Conditions
none

T Course: Special Functions and Applications in Potential Theory [T-MATH-102274]

Responsibility: Andreas Kirsch
Contained in: [M-MATH-101335] Special Functions and Applications in Potential Theory

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

Conditions
None

T Course: Special Topics in Harmonic Analysis [T-MATH-109065]

Responsibility: Dirk Hundertmark
Contained in: [M-MATH-104435] Special Topics in Harmonic Analysis

ECTS	Recurrence	Exam type	Version
3	Unregelmäßig	Prüfungsleistung schriftlich	1

Conditions
none

T Course: Special Topics of Efficient Algorithms [T-WIWI-102657]

Responsibility: Hartmut Schmeck
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
5	Jedes Semester	Prüfungsleistung anderer Art	1

Learning Control / Examinations

The assessment consists of assignments or of a bonus exam (wrt §4 (2), 3 SPO), and a written exam (60 min.) in the week after the end of the lecturing periodwrt (§4 (2), 1 SPO). The exam will be offered in every semester and can be repeated on regular examination dates.
If the mark obtained in the written exam is in between 1.3 and 4.0, a successful completion of the assignments or the bonus exam will improve the mark by one level (i.e. by 0.3 or 0.4).

Conditions

None

Remarks

This course can be particularly used for recognising the external courses with the topics in the area of algorithms, data-structures and computer infrastructures but are not associated in other courses in this subject area.

T Course: Special Topics of Enterprise Information Systems [T-WIWI-102676]

Responsibility: Andreas Oberweis
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
5	Jedes Semester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2511228		Vorlesung (V)	2	Agnes Koschmider

Learning Control / Examinations
The assessment of this course is a written examination (60 min.) or (if necessary) oral examination (30 min.) according to §4(2) of the examination regulation.

Conditions
None

T Course: Special Topics of Numerical Linear Algebra [T-MATH-105891]

Responsibility: Marlis Hochbruck
Contained in: [M-MATH-102920] Special Topics of Numerical Linear Algebra

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Conditions
none

T Course: Special Topics of Software- and Systemsengineering [T-WIWI-102678]

Responsibility: Andreas Oberweis
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
5	Jedes Semester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment consists of an 1h written exam in the first week after lecture period.

Conditions
None

Remarks
This course can be used in particular for the acceptance of external courses whose content is in the broader area of software and systems engineering, but cannot assigned to another course of this topic.

T Course: Special Topics of Web Science [T-WIWI-108751]

Responsibility: York Sure-Vetter
Contained in: [M-WIWI-101472] Informatics

ECTS	Recurrence	Exam type	Version
5	Jedes Semester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
Assesment is provided by a written exam of 60 minutes or an oral exam during the first few weeks after the lecturing period (acc. to §4(2), 1 or 2 SPO). The exam is offered each semester and may be repeated at the regular examination day.

Conditions
None

Remarks
see german version

T Course: Spectral Theory - Exam [T-MATH-103414]

Responsibility: Gerd Herzog, Peer Kunstmann, Christoph Schmoeger, Roland Schnaubelt, Lutz Weis
Contained in: [M-MATH-101768] Spectral Theory

ECTS	Language	Exam type	Version
8	englisch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0163700		Vorlesung (V)	4	Peer Kunstmann
SS 2018	0163710		Übung (Ü)	2	Peer Kunstmann

V Event excerpt: (SS 2018)

Literature
On my webpage one can find the PDF file of the manuscript of my lecture Spectral Theory from summer semester 2010. Presumably, an updated version will be delivered during lecture time. A few relevant monographs:

- H.W. Alt: Lineare Funktionalanalysis. Springer.
- H. Brezis: Functional Analysis, Sobolev Spaces and Partial Differential Equations. Springer.
- J.B. Conway: A Course in Functional Analysis. Springer.
- N. Dunford, J.T. Schwartz: Linear Operators. Part I: General Theory. Wiley.
- T Kato: Perturbation Theory of Linear Operators. Springer.
- A.E. Taylor, D.C. Lay: Introduction to Functional Analysis. Wiley.
- D. Werner: Funktionalanalysis. Springer.

T Course: Statistical Modeling of generalized regression models [T-WIWI-103065]

Responsibility: Wolf-Dieter Heller
Contained in: [M-WIWI-101638] Econometrics and Statistics I
[M-WIWI-101639] Econometrics and Statistics II

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2521350		Vorlesung (V)	2	Wolf-Dieter Heller

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation.

Conditions
None

Modeled Conditions
The following conditions must be met:

- The course [T-MATH-105870] *Generalized Regression Models* must not have been started.

Recommendations
Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics" [2520016]

V Event excerpt: (WS 18/19)

Aim
The student

- shows comprehensive knowledge of regression techniques

Workload
The total workload for this course is approximately 135 hours (4.5 credits).
regular attendance: 30 hours
self-study: 65 hours
exam preparation: 40 hours

T Course: Stein's Method [T-MATH-105914]

Responsibility: Matthias Schulte
Contained in: [M-MATH-102946] Stein's Method

ECTS	Exam type	Version
5	Prüfungsleistung mündlich	1

Conditions
none

T Course: Stochastic Calculus and Finance [T-WIWI-103129]

Responsibility: Mher Safarian
Contained in: [M-WIWI-101639] Econometrics and Statistics II

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2521331	Stochastic Calculus and Finance	Vorlesung (V)	2	Mher Safarian

Learning Control / Examinations
The assessment of this course consists of a written examination (§4(2), 1 SPOs, 180 min.) and of possibble additional assignments during the course (§4 (3) SPO).

Conditions
None

Remarks
For more information see http://statistik.econ.kit.edu/

V Event excerpt: Stochastic Calculus and Finance (WS 18/19)

Aim
After successful completion of the course students will be familiar with many common methods of pricing and portfolio models in finance. Emphasis we be put on both finance and the theory behind it.

Content
The course will provide rigorous yet focused training in stochastic calculus and finance. The program will cover modern approaches in stochastic calculus and mathematical finance. Topics to be covered:

1. Stochastic Calculus. Stochastic Processes, Brownian Motion and Martingales, Stopping Times, Local martingales, Doob-Meyer Decomposition, Quadratic Variation, Stochastic Integration, Ito Formula, Girsanov Theorem, Jump-diffusion Processes. Stable and tempered stable processes. Levy processes.
2. Mathematical Finance: Pricing Models. The Black-Scholes Model, State prices and Equivalent Martingale Measure, Complete Markets and Redundant Security Prices, Arbitrage Pricing with Dividends, Term-Structure Models (One Factor Models, Cox-Ingersoll-Ross Model, Affine Models), Term-Structure Derivatives and Hedging, Mortgage-Backed Securities, Derivative Assets (Forward Prices, Future Contracts, American Options, Look-back Options), Option pricing with tempered stable and Levy-Processes and volatility clustering, Optimal Portfolio and Consumption Choice (Stochastic Control and Merton continuous time optimization problem), Equilibrium models, Consumption-Based CAPM, Numerical Methods.

Stochastic processes (Poisson-process, Brownian motion, martingales), stochastic Integral (Integral, quadratic und co-variation, Ito-formula), stochastic differential equation for price-processes, trading strategies, option pricing(Feynman-Kac), neutral risk rating(equivalent martingale measure, Girsanov theorem), term structure models

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
To be announced in lecture.
Elective literature:

- Dynamic Asset Pricing Theory, Third Edition. by Darrell Duffie, Princeton University Press, 1996
- Stochastic Calculus for Finance II: Continuous-Time Models, by Steven E. Shreve , Springer, 2003
- An Introduction to Stochastic Integration (Probability and its Applications) by Kai L. Chung , Ruth J. Williams , Birkhaueser,

- Methods of Mathematical Finance by Ioannis Karatzas , Steven E. Shreve , Springer 1998
- Kim Y.S. ,Rachev S.T. ,Bianchi M-L, Fabozzi F. Financial market models with Levy processes and time-varying volatility, Journal of Banking and Finance, 32/7,1363-1378, 2008.
- Hull, J., Options, Futures, & Other Derivatives, Prentice Hall, Sixth Edition, (2005).

T Course: Stochastic Control [T-MATH-105871]

Responsibility: Nicole Bäuerle
Contained in: [M-MATH-102908] Stochastic Control

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	1

Conditions
none

T Course: Stochastic Differential Equations [T-MATH-105852]

Responsibility: Roland Schnaubelt, Lutz Weis
Contained in: [M-MATH-102881] Stochastic Differential Equations

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	0105500		Vorlesung (V)	4	Lutz Weis
WS 18/19	0105510		Übung (Ü)	2	Lutz Weis

T Course: Stochastic Evolution Equations [T-MATH-105910]

Responsibility: Lutz Weis
Contained in: [M-MATH-102942] Stochastic Evolution Equations

ECTS	Language	Exam type	Version
8	englisch	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0156400		Vorlesung (V)	4	Lutz Weis
SS 2018	0156410		Übung (Ü)	2	Lutz Weis

Conditions
none

T Course: Stochastic Geometry [T-MATH-105840]

Responsibility: Daniel Hug, Günter Last
Contained in: [M-MATH-102865] Stochastic Geometry

ECTS	Exam type	Version
8	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0152600	Stochastic Geometry	Vorlesung (V)	4	Steffen Winter
SS 2018	0152610		Übung (Ü)	2	Steffen Winter

T Course: Strategic Brand Management [T-WIWI-102842]

Responsibility: Joachim Blickhäuser, Martin Klarmann
Contained in: [M-WIWI-101490] Marketing Management

ECTS	Language	Recurrence	Exam type	Version
1.5	deutsch	Jedes Sommersemester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2571185	Strategic Brand Management	Block (B)		Joachim Blickhäuser, Martin Klarmann

Learning Control / Examinations
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015). The assessment consists of group presentation with a subsequent round of questions totalling about 30 minutes.

Conditions
None

Recommendations
None

Remarks
Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop.
Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.
In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in summer term starts.

V Event excerpt: Strategic Brand Management (SS 2018)

Aim
See German version.

Content
Die Veranstaltung konzentriert sich auf das strategische Markenmanagement. Der Fokus liegt dabei auf zentralen Branding-Elementen wie z.B. Markenpositionierungen und –identitäten. Gehalten wird die Veranstaltung von Herrn Blickhäuser, einem langjährigen Manager der BMW Group, der aktuell für das Brand Management des Automobilherstellers zuständig ist.

Workload
The total workload for this course is approximately 45.0 hours. For further information see German version.

Literature
Homburg, Christian (2016), Marketingmanagement, 6. ed., Wiesbaden.

T Course: Strategic Management of Information Technology [T-WIWI-102669]

Responsibility: Thomas Wolf
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511602	Strategic Management of Information Technology	Vorlesung (V)	2	Thomas Wolf
SS 2018	2511603		Übung (Ü)	1	Thomas Wolf

Learning Control / Examinations
The assessment of this course is a written (60 min.) or (if necessary) oral examination according (30 min.) to §4(2) of the examination regulation.

Conditions
None

V Event excerpt: Strategic Management of Information Technology (SS 2018)

Aim
Students know the outer frame of IT in an enterprise and know which functions IT has within an enterprise. They unterstand the organization and the content of these functions.

Content
The following topics will be covered: strategic planing of ICT, architecture of ICT, overall planning of ICT, outsourcing, operation and controlling of ICT.

Literature

- Nolan, R., Croson, D.: Creative Destruction: A Six-Stage Process for Transforming the Organization. Harvard Business School Press, Boston Mass. 1995
- Heinrich, L. J., Burgholzer, P.: Informationsmanagement, Planung, Überwachung, Steuerung d. Inform.-Infrastruktur. Oldenbourg, München 1990
- Nolan, R.: Managing the crises in data processing. Harvard Business Review, Vol. 57, Nr. 2 1979
- Österle, H. et al.: Unternehmensführung und Informationssystem. Teubner, Stuttgart 1992
- Thome, R.: Wirtschaftliche Informationsverarbeitung. Verlag Franz Vahlen, München 1990

T Course: Strategy and Management Theory: Developments and “Classics” [T-WIWI-106190]

Responsibility: Hagen Lindstädt
Contained in: [M-WIWI-103119] Advanced Topics in Strategy and Management

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Unregelmäßig	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2577923	Strategy and Management Theory: Developments and "Classics"	Seminar (S)	2	Kerstin Fehre, Alexander Klopfer, Hagen Lindstädt
WS 18/19	2577922	Strategy and Management Theory: Developments and "Classics"	Seminar (S)	2	Assistenten, Hagen Lindstädt

Learning Control / Examinations
Non exam assessment (following §4(2) 3 of the examination regulation).

Conditions
None

Recommendations
Basic knowledge as conveyed in the bachelor module „Strategy and Organization“ is recommended.

Remarks
This course is admission restricted. If you were already admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

The course is planned to be held for the first time in the winter term 2017/18.

V Event excerpt: Strategy and Management Theory: Developments and "Classics" (WS 18/19)

Aim
Students

- are able to explain and evaluate theoretical approaches and models in the field of strategic management and can illustrate them by tangible examples
- learn to express their position in structured discussions

Content
In this lecture, students discuss and evaluate models in the field of strategic management with a focus on applicability and theory based limitations. Critical examination of current research results will be a substantial part of this course.

Workload
The total workload for this course is approximately 90 hours.
Lecture: 15 hours
Preparation of lecture: 75 hours
Exam preparation: n/a

V Event excerpt: Strategy and Management Theory: Developments and "Classics" (SS 2018)

Aim
Students

- are able to explain and evaluate theoretical approaches and models in the field of strategic management and can illustrate them by tangible examples
- learn to express their position in structured discussions

Content
In this lecture, students discuss and evaluate models in the field of strategic management with a focus on applicability and theory based limitations. Critical examination of current research results will be a substantial part of this course.

Workload
The total workload for this course is approximately 90 hours.
Lecture: 15 hours
Preparation of lecture: 75 hours
Exam preparation: n/a

T Course: Supply Chain Management in the Process Industry [T-WIWI-102860]

Responsibility: Stefan Nickel
Contained in: [M-WIWI-102805] Service Operations

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2550494	Supply Chain Management in the Process Industry	Vorlesung / Übung (VÜ)	3	Robert Blackburn

Learning Control / Examinations
The assessment is a 60 minutes written examination (according to §4(2), 1 of the examination regulation) (individual grading), case study presentation by student teams (team grading) and classroom participation (individual grading). The examination is held in the term of the lecture.

Conditions
None

Recommendations
Basic knowledge as conveyed in the module Introduction to Operations Research is assumed.
Advanced knowledge of Operations Research (e.g., as conveyed in the lectures Facility Location and Strategic SCM, Tactical and operational SCM) is recommended.

Remarks
The number of participants is restricted due to the execution of interactive case studies and the resulting examination effort. Due to these capacity restrictions, registration before course start is required according to the information on the course website. The course is planned to be held every winter term. The planned lectures and courses for the next three years are announced online.

V Event excerpt: Supply Chain Management in the Process Industry (WS 18/19)

Aim
The student

- knows and classifies state-of-the art approaches for designing, planning and managing global supply chains in the process industry
- distingusihes quality in supply chains and identifies important building blocks, repeating patterns and concepts crucial to supply chain strategy, design and planning,
- explains specific challenges and approaches towards supply chain operations within the process industry with regards to transportation and warehousing, and describes the interdisciplinary linkage of SCM with information systems, performance management, project management, risk management and sustainability management,
- transfers gained knowledge into practice by using SCM case studies and SCM real life project documentations.

Content
The course “Supply Chain Management in the Process Industry” covers fundamental concepts in the field of supply chain management with special focus on process industry. Strategic, planning and operational topics within the end-to-end supply chain are examined, covering relevant approaches in design, processes and performance measurement. Additional focus within the course is on showing the interdisciplinary linkages SCM has with information systems, performance management, project management, risk management and sustainability management. The course is enriched by various insights from the world´s leading chemical company BASF, provided by executive management as real life examples and cases.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Chopra, S./Meindl, P.: Supply Chain Management – Strategy, Planning, & Operations, 4th edition, Upper Saddle River, 2009.
- Various case studies, which will be provided during the course

T Course: Tactical and Operational Supply Chain Management [T-WIWI-102714]

Responsibility: Stefan Nickel
Contained in: [M-WIWI-101413] Applications of Operations Research
[M-WIWI-102832] Operations Research in Supply Chain Management

ECTS	Language	Recurrence	Exam type	Version
4.5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2550486		Vorlesung (V)	2	Stefan Nickel
SS 2018	2550487		Übung (Ü)	1	Mitarbeiter, Stefan Nickel

Learning Control / Examinations
The assessment consists of a written exam (120 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.
Prerequisite for admission to examination is the succesful completion of the online assessments.

Conditions
Prerequisite for admission to examination is the succesful completion of the online assessments.

Recommendations
None

Remarks
The lecture is held in every summer term. The planned lectures and courses for the next three years are announced online.

V Event excerpt: (SS 2018)

Aim
The student

- gathers expertise in fundamental techniques from procurement and distribution logistics, methods from inventory management and lot sizing,
- acquires the ability to efficiently utilize quantitative models from transportation planning (long-distance and distribution planning), inventory management and lot sizing in production,
- applies the introduced methods in more detail and in industry-relevant case-studies.

Content
The lecture covers basic quantitative methods in location planning in the context of strategic Supply Chain Planning. Besides the discussion of several criteria for the evaluation of the locations of facilities, the students are acquainted with classical location planning models (planar models, network models and discrete models) and advanced location planning models designed for Supply Chain Management (single-period and multi-period models).The exercisesaccompanying the lecture offer the possibility to apply the considered models to practical problems.

Literature
Elective Literature

- Daskin: Network and Discrete Location: Models, Algorithms, and Applications, Wiley, 1995
- Domschke, Drexl: Logistik: Standorte, 4. Auflage, Oldenbourg, 1996
- Francis, McGinnis, White: Facility Layout and Location: An Analytical Approach, 2nd Edition, Prentice Hall, 1992
- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988
- Thonemann: Operations Management - Konzepte, Methoden und Anwendungen, Pearson Studium, 2005

T Course: Technological Change in Energy Economics [T-WIWI-102694]

Responsibility: Martin Wietschel
Contained in: [M-WIWI-101452] Energy Economics and Technology

ECTS	Recurrence	Exam type	Version
3	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The examination will be offered latest until summer term 2018 (repeaters only).
The assessment consists of a written exam (60 min) (according to Section 4(2), 1 of the examination regulation).

Recommendations
None

T Course: The Riemann Zeta Function [T-MATH-105934]

Responsibility: Fabian Januszewski
Contained in: [M-MATH-102960] The Riemann Zeta Function

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	1

T Course: Theory of Endogenous Growth [T-WIWI-102785]

Responsibility: Ingrid Ott
Contained in: [M-WIWI-101478] Innovation and Growth
[M-WIWI-101496] Growth and Agglomeration

ECTS	Recurrence	Exam type	Version
4.5	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Learning Control / Examinations

The assessment consists of a written exam (60 min) according to Section 4(2), 1 of the examination regulation. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.
Students will be given the opportunity of writing and presenting a short paper during the lecture time to achieve a bonus on the exam grade. If the mandatory credit point exam is passed, the awarded bonus points will be added to the regular exam points. A deterioration is not possible by definition, and a grade does not necessarily improve, but is very likely to (not every additional point improves the total number of points, since a grade can not become better than 1). The voluntary elaboration of such a paper can not countervail a fail in the exam.

Conditions

None

Recommendations

Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

Remarks

Due to the research semester of Prof. Dr. Ingrid Ott, the course is not offered in the winter term 2018/19.

T Course: Time Series Analysis [T-MATH-105874]

Responsibility: Norbert Henze, Bernhard Klar
Contained in: [M-MATH-102911] Time Series Analysis

ECTS	Exam type	Version
4	Prüfungsleistung mündlich	2

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0178000		Vorlesung (V)	2	Tilmann Gneiting
SS 2018	0178010		Übung (Ü)	1	Tilmann Gneiting

T Course: Topics in Experimental Economics [T-WIWI-102863]

Responsibility: Johannes Philipp Reiß
Contained in: [M-WIWI-101505] Experimental Economics

ECTS	Recurrence	Exam type	Version
4.5	Unregelmäßig	Prüfungsleistung schriftlich	1

Learning Control / Examinations
The assessment consists of a written exam (following §4(2), 1 of the examination regulation).

Conditions
None

Recommendations
Basic knowledge of Experimental Economics is assumed. Therefore, it is strongly recommended to attend the course Experimental Economics beforehand.

Remarks
The course is offered in summer 2020 for the next time, not in summer 2018.

T Course: Topics in number theory: class field theory and zeta-functions [T-MATH-107069]

Responsibility: Claus-Günther Schmidt
Contained in: [M-MATH-103543] Topics in number theory: class field theory and zeta-functions

ECTS	Recurrence	Exam type	Version
8	Einmalig	Prüfungsleistung mündlich	1

Conditions
none

T Course: Traveling Waves [T-MATH-105897]

Responsibility: Jens Rottmann-Matthes
Contained in: [M-MATH-102927] Traveling Waves

ECTS	Exam type	Version
6	Prüfungsleistung mündlich	1

Course: Uncertainty Quantification [T-MATH-108399]

Responsibility: Martin Frank
Contained in: [M-MATH-104054] Uncertainty Quantification

ECTS	Language	Recurrence	Exam type	Version
4	englisch	Unregelmäßig	Prüfungsleistung mündlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	0164400		Vorlesung (V)	2	Martin Frank
SS 2018	0164410		Übung (Ü)	1	Martin Frank

Conditions
none

Event excerpt: (SS 2018)

Content
In the first part, we learn about the techniques used in UQ. In hands-on programming exercises, students apply these techniques to either a problem of their own choice or one of several given examples. In the second part, we study the theoretical foundations of these methods.

Literature

- R.C. Smith: Uncertainty Quantification: Theory, Implementation, and Applications, SIAM, 2014.
- T.J. Sullivan: Introduction to Uncertainty Quantification, Springer-Verlag, 2015.
- D. Xiu: Numerical Methods for Stochastic Computations, Princeton University Press, 2010.
- O.P. Le Maître, O.M. Knio: Spectral Methods for Uncertainty Quantification, Springer-Verlag, 2010.
- R. Ghanem, D. Higdon, H. Owhadi:Handbook of Uncertainty Quantification, Springer-Verlag, 2017.

T Course: Valuation [T-WIWI-102621]

Responsibility: Martin Ruckes
Contained in: [M-WIWI-101480] Finance 3
[M-WIWI-101482] Finance 1
[M-WIWI-101483] Finance 2

ECTS	Language	Recurrence	Exam type	Version
4.5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2530212	Valuation	Vorlesung (V)	2	Martin Ruckes
WS 18/19	2530213		Übung (Ü)	1	Martin Ruckes, Meik Scholz-Daneshgari

Learning Control / Examinations
See German version.

Conditions
None

Recommendations
None

V Event excerpt: Valuation (WS 18/19)

Aim
Students are able to

- evaluate complex investment projects by taking a financial view,
- value firms,
- assess the advantageousness of potential merger and acquisitions.

Content
Topics:

- Projections of cash flows
- Estimation of the cost of capital
- Valuation of the firm
- Mergers and acquisitions
- Real options

Literature
Elective Literature
Titman/Martin (2013): *Valuation - The Art and Science of Corporate Investment Decisions*, 2nd. ed. Pearson International.

T Course: Wavelets [T-MATH-105838]

Responsibility: Andreas Rieder
Contained in: [M-MATH-102895] Wavelets

ECTS	Recurrence	Exam type	Version
8	Unregelmäßig	Prüfungsleistung mündlich	1

Learning Control / Examinations
Mündliche Prüfung im Umfang von ca. 30 Minuten.

Conditions
none

T Course: Web Science [T-WIWI-103112]

Responsibility: York Sure-Vetter
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	englisch	Jedes Wintersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2511312	Web Science	Vorlesung (V)	2	York Sure-Vetter
WS 18/19	2511313	Exercises to Web Science	Übung (Ü)	1	Lars Heling, York Sure-Vetter

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Conditions
None

Remarks
New course starting winter term 2015/2016.

V Event excerpt: Web Science (WS 18/19)

Aim
The students

- look critically into current research topics in the field of Web Science and learns in particular about the topics small-world-problem, network theory, social network analysis, bibliometrics, as well as link analysis and search.
- apply interdisciplinary thinking.
- train the application of technological approaches to social science problems.

Content
This course aims to provide students with a basic knowledge and understanding about the structure and analysis of selected web phenomena and technologies. Topics include the small world problem, network theory, social network analysis, graph search and technologies/standards/architectures.

Workload

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preperation and postprocessing: 67.5 hours
- Exam and exam preperation: 37.5 hours

Literature

- Networks, Crowds, and Markets: Reasoning About a Highly Connected World, by David Easley and Jon Kleinberg, 2010 (free online book: http://www.cs.cornell.edu/home/kleinber/networks-book/)
- Thelwall, M. (2009). Social network sites: Users and uses. In: M. Zelkowitz (Ed.), Advances in Computers 76. Amsterdam: Elsevier (pp. 19-73)

T Course: Workflow-Management [T-WIWI-102662]

Responsibility: Andreas Oberweis
Contained in: [M-WIWI-101472] Informatics

ECTS	Language	Recurrence	Exam type	Version
5	deutsch	Jedes Sommersemester	Prüfungsleistung schriftlich	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2511204	Workflow-Management	Vorlesung (V)	2	Agnes Koschmider, Andreas Oberweis
SS 2018	2511205		Übung (Ü)	1	Andreas Drescher, Tobias Heuser, Agnes Koschmider, Andreas Oberweis

Learning Control / Examinations
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Conditions
None

V Event excerpt: Workflow-Management (SS 2018)

Aim
Students

- explain the concepts and principles of workflow management concepts and systems and their applications,
- create and evaluatel business process models,
- analyze static and dynamic properties of workflows.

Content
A workflow is that part of a business process which is automatically executed by a computerized system. Workflow management includes the design, modelling, analysis, execution and management of workflows. Workflow management systems are standard software systems for the efficient control of processes in enterprises and organizations. Knowledge in the field of workflow management systems is especially important during the design of systems for process support.
The course covers the most important concepts of workflow management. Modelling and design techniques are presented and an overview about current workflow management systems is given. Standards, which have been proposed by the workflow management coalition (WfMC), are discussed. Petri nets are proposed as a formal modelling and analysis tool for business processes. Architecture and functionality of workflow management systems are discussed. The course is a combination of theoretical foundations of workflow management concepts and of practical application knowledge.

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam 1h

Total: 150h

Literature

- W. van der Aalst, H. van Kees: Workflow Management: Models, Methods and Systems, Cambridge 2002: The MIT Press.
- M. Weske: Business Process Management: Concepts, Languages, Architectures. Springer 2012.
- A. Oberweis: Modellierung und Ausführung von Workflows mit Petri-Netzen. Teubner-Reihe Wirtschaftsinformatik, B.G. Teubner Verlag, 1996.
- F. Schönthaler, G.Vossen, A. Oberweis, T. Karle: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer 2012.

  Further literature is given in the lecture.

T Course: Workshop Business Wargaming – Analyzing Strategic Interactions [T-WIWI-106189]

Responsibility: Hagen Lindstädt
Contained in: [M-WIWI-103119] Advanced Topics in Strategy and Management

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Jedes Sommersemester	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
SS 2018	2577912	Workshop Business Wargaming - Analyzinig Strategic Interactions	Seminar (S)	2	Nicolas Burkardt, Hagen Lindstädt

Learning Control / Examinations
Non exam assessment (following §4(2) 3 of the examination regulation).

Conditions
None

Recommendations
Basic knowledge as conveyed in the bachelor module „Strategy and Organization“ is recommended.

Remarks
This course is admission restricted. If you were already admitted to another course in the module "Advanced Topics in Strategy and Management" the participation at this course will be guaranteed.

The course is planned to be held for the first time in the summer term 2018.

V Event excerpt: Workshop Business Wargaming - Analyzinig Strategic Interactions (SS 2018)

Aim
Der/die Studierende

- können selbstständig und strukturiert strategische Konfliktsituationen analysieren und Empfehlungen ableiten
- können ihre Position durch eine durchdachte Argumentationsweise in strukturierten Diskussionen überzeugend darlegen

Content
In this course, students simulate and analyze real-life conflict situations using Business Wargaming methods. The students will be able to understand the underlying structure and dynamics of various conflicts, this includes making own conclusions as well as deriving strategic recommendations.

Workload
The total workload for this course is approximately 90 hours.
Lecture: 15 hours
Preparation of lecture: 75 hours
Exam preparation: n/a

T Course: Workshop Current Topics in Strategy and Management [T-WIWI-106188]

Responsibility: Hagen Lindstädt
Contained in: [M-WIWI-103119] Advanced Topics in Strategy and Management

ECTS	Language	Recurrence	Exam type	Version
3	deutsch	Unregelmäßig	Prüfungsleistung anderer Art	1

Events

Term	Event-No.	Events	Type	SWS	Lecturers
WS 18/19	2577921	Workshop Current Topics in Strategy and Management	Seminar (S)	2	Assistenten, Hagen Lindstädt

Learning Control / Examinations
Non exam assessment (following §4(2) 3 of the examination regulation).

Conditions
None

Recommendations
Basic knowledge as conveyed in the bachelor module „Strategy and Organization“ is recommended.

Remarks
This course is admission restricted. If you were already admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.
The course is planned to be held for the first time in the winter term 2017/18.

V Event excerpt: Workshop Current Topics in Strategy and Management (WS 18/19)

Aim
Students

- are able to analyze business strategies and derive recommendations for the management
- learn to express their position through compelling reasoning in structured discussions

Content
In this lecture, current economic trends will be discussed from a perspective of competition analysis and corporate strategies. Using appropriate frameworks, the students will be able to analyze collectively selected case studies and derive business strategies.

Workload
The total workload for this course is approximately 90 hours.
Lecture: 15 hours
Preparation of lecture: 75 hours
Exam preparation: n/a

Studien- und Prüfungsordnung der Universität Karlsruhe (TH) für den Masterstudiengang Wirtschaftsmathematik

Aufgrund von § 34 Abs. 1, Satz 1 des Landeshochschulgesetzes (LHG) vom 1. Januar 2005 hat die beschließende Senatskommission für Prüfungsordnungen der Universität Karlsruhe (TH) am 13. Februar 2009 die folgende Studien- und Prüfungsordnung für den Masterstudiengang Wirtschaftsmathematik beschlossen.

Der Rektor hat seine Zustimmung am 28. August 2009 erteilt.

Inhaltsverzeichnis

Die Universität Karlsruhe (TH) hat sich im Rahmen der Umsetzung des Bolognaprozesses zum Aufbau eines Europäischen Hochschulraumes zum Ziel gesetzt, dass am Abschluss der Studierendenausbildung an der Universität Karlsruhe (TH) der Mastergrad stehen soll. Die Universität Karlsruhe (TH) sieht daher die an der Universität Karlsruhe (TH) angebotenen konsekutiven Bachelor- und Masterstudiengänge als Gesamtkonzept mit konsekutivem Curriculum.

In dieser Satzung ist nur die weibliche Sprachform gewählt worden. Alle personenbezogenen Aussagen gelten jedoch stets für Frauen und Männer gleichermaßen.

I. Allgemeine Bestimmungen

§ 1 Geltungsbereich, Zweck der Prüfung

(1) Diese Masterprüfungsordnung regelt Studienablauf, Prüfungen und den Abschluss des Studiums im Masterstudiengang Wirtschaftsmathematik an der Universität Karlsruhe (TH).

(2) Im Masterstudium sollen die im Bachelorstudium erworbenen wissenschaftlichen Qualifikationen weiter vertieft oder ergänzt werden. Die Studentin soll in der Lage sein, die wissenschaftlichen Erkenntnisse und Methoden selbstständig anzuwenden und ihre Bedeutung und Reichweite für die Lösung komplexer wissenschaftlicher und gesellschaftlicher Problemstellungen zu bewerten.

§ 2 Akademischer Grad

Aufgrund der bestandenen Masterprüfung wird der akademische Grad „Master of Science“ (abgekürzt: „M.Sc.“) verliehen.

§ 3 Regelstudienzeit, Studienaufbau, Leistungspunkte

(1) Die Regelstudienzeit beträgt vier Semester. Sie umfasst neben den Lehrveranstaltungen Prüfungen und die Masterarbeit.

(2) Die im Studium zu absolvierenden Lehrinhalte sind in Module gegliedert, die jeweils aus einer Lehrveranstaltung oder mehreren, thematisch und zeitlich aufeinander bezogenen Lehrveranstaltungen bestehen. Art, Umfang und Zuordnung der Module zu einem Fach sowie die Möglichkeiten, Module untereinander zu kombinieren, beschreibt der Studienplan. Die Fächer und deren Umfang werden in § 17 definiert.

(3) Der für das Absolvieren von Lehrveranstaltungen und Modulen vorgesehene Arbeitsaufwand wird in Leistungspunkten (Credits) ausgewiesen. Die Maßstäbe für die Zuordnung von Leistungspunkten entsprechen dem ECTS (European Credit Transfer System). Ein Leistungspunkt entspricht einem Arbeitsaufwand von etwa 30 Stunden.

(4) Der Umfang der für den erfolgreichen Abschluss des Studiums erforderlichen Studienleistungen wird in Leistungspunkten gemessen und beträgt insgesamt 120 Leistungspunkte.

(5) Die Verteilung der Leistungspunkte im Studienplan auf die Semester hat in der Regel gleichmäßig zu erfolgen.

(6) Lehrveranstaltungen können auch in englischer Sprache angeboten werden.

§ 4 Aufbau der Prüfungen

(1) Die Masterprüfung besteht aus einer Masterarbeit und Modulprüfungen, jede Modulprüfung aus einer oder mehreren Modulteilprüfungen. Eine Modulteilprüfung besteht aus mindestens einer Erfolgskontrolle.

(2) Erfolgskontrollen sind:

1. schriftliche Prüfungen,
2. mündliche Prüfungen oder
3. Erfolgskontrollen anderer Art.

Erfolgskontrollen anderer Art sind z.B. Vorträge, Übungsscheine, Projekte, schriftliche Arbeiten, Berichte, Seminararbeiten und Klausuren, sofern sie nicht als schriftliche oder mündliche Prüfung in der Modul- oder Lehrveranstaltungsbeschreibung im Studienplan ausgewiesen sind.

(3) In der Regel sind mindestens 50 % einer Modulprüfung in Form von schriftlichen oder mündlichen Prüfungen (Absatz 2, Nr. 1 und 2) abzulegen, die restlichen Prüfungen erfolgen durch Erfolgskontrollen anderer Art (Absatz 2, Nr. 3). Hiervon ausgenommen sind Seminarmodule.

§ 5 Anmeldung und Zulassung zu den Prüfungen

(1) Um an den Modulprüfungen teilnehmen zu können, muss sich die Studentin schriftlich oder per Online-Anmeldung beim Studienbüro anmelden. Hierbei sind die gemäß dem Studienplan für die jeweilige Modulprüfung notwendigen Studienleistungen nachzuweisen. Darüber hinaus muss sich die Studentin für jede einzelne Modulteilprüfung, die in Form einer schriftlichen oder mündlichen Prüfung (§ 4 Abs. 2, Nr. 1 und 2) durchgeführt wird, beim Studienbüro anmelden. Dies gilt auch für die Anmeldung zur Masterarbeit.

(2) Um zu schriftlichen und/oder mündlichen Prüfungen (§ 4 Abs. 2, Nr. 1 und 2) in einem bestimmten Modul zugelassen zu werden, muss die Studentin vor der ersten schriftlichen oder mündlichen Prüfung in diesem Modul beim Studienbüro eine bindende Erklärung über die Wahl des betreffenden Moduls und dessen Zuordnung zu einem Fach, wenn diese Wahlmöglichkeit besteht, abgeben.

(3) Die Zulassung darf nur abgelehnt werden, wenn die Studentin in einem mit der Wirtschaftsmathematik oder den Wirtschaftswissenschaften vergleichbaren oder einem verwandten Studiengang bereits eine Diplomvorprüfung, Diplomprüfung, Bachelor- oder Masterprüfung endgültig nicht bestanden hat, sich in einem Prüfungsverfahren befindet oder den Prüfungsanspruch in einem solchen Studiengang verloren hat. In Zweifelsfällen entscheidet der Prüfungsausschuss.

§ 6 Durchführung von Prüfungen und Erfolgskontrollen

(1) Erfolgskontrollen werden studienbegleitend, in der Regel im Verlauf der Vermittlung der Lehrinhalte der einzelnen Module oder zeitnah danach, durchgeführt.

(2) Die Art der Erfolgskontrolle (§ 4 Abs. 2, Nr. 1 bis 3) der einzelnen Lehrveranstaltungen wird von der Prüferin der betreffenden Lehrveranstaltung in Bezug auf die Lehrinhalte der Lehrveranstaltung und die Lehrziele des Moduls festgelegt. Die Prüferin, die Art der Erfolgskontrollen, deren Häufigkeit, Reihenfolge und Gewichtung und die Bildung der Lehrveranstaltungsnote müssen mindestens sechs Wochen vor Semesterbeginn bekannt gegeben werden. Im Einvernehmen zwischen Prüferin und Studentin kann die Art der Erfolgskontrolle auch nachträglich geändert werden. Dabei ist jedoch § 4 Abs. 3 zu berücksichtigen.

(3) Eine schriftlich durchzuführende Prüfung kann auch mündlich, eine mündlich durchzuführende Prüfung kann auch schriftlich abgenommen werden. Diese Änderung muss mindestens sechs Wochen vor der Prüfung bekannt gegeben werden.

(4) Weist eine Studentin nach, dass sie wegen länger andauernder oder ständiger körperlicher Behinderung nicht in der Lage ist, die Erfolgskontrollen ganz oder teilweise in der vorgeschriebenen

Form abzulegen, kann der zuständige Prüfungsausschuss – in dringenden Angelegenheiten, deren Erledigung nicht bis zu einer Sitzung des Ausschusses aufgeschoben werden kann, dessen Vorsitzende – gestatten, Erfolgskontrollen in einer anderen Form zu erbringen. Auf begründeten Antrag kann der Prüfungsausschuss auch in anderen Ausnahmefällen gestatten, Erfolgskontrollen in einer anderen Form zu erbringen.

(5) Bei Lehrveranstaltungen in englischer Sprache können mit Zustimmung der Studentin die entsprechenden Erfolgskontrollen in englischer Sprache abgenommen werden.

(6) Schriftliche Prüfungen (§ 4 Abs. 2, Nr. 1) sind in der Regel von einer Prüferin nach § 15 Abs. 2 oder § 15 Abs. 3 zu bewerten. Die Note ergibt sich aus dem arithmetischen Mittel der Einzelbewertungen. Entspricht das arithmetische Mittel keiner der in § 7 Abs. 2, Satz 2 definierten Notenstufen, so ist auf die nächstliegende Notenstufe zu runden. Bei gleichem Abstand ist auf die nächstbessere Notenstufe zu runden. Das Bewertungsverfahren soll sechs Wochen nicht überschreiten. Schriftliche Einzelprüfungen dauern mindestens 60 und höchstens 240 Minuten.

(7) Mündliche Prüfungen (§ 4 Abs. 2, Nr. 2) sind von mehreren Prüferinnen (Kollegialprüfung) oder von einer Prüferin in Gegenwart einer Beisitzenden als Gruppen- oder Einzelprüfungen abzunehmen und zu bewerten. Vor der Festsetzung der Note hört die Prüferin die anderen an der Kollegialprüfung mitwirkenden Prüferinnen an. Mündliche Prüfungen dauern in der Regel mindestens 15 Minuten und maximal 45 Minuten pro Studentin.

(8) Die wesentlichen Gegenstände und Ergebnisse der mündlichen Prüfung in den einzelnen Fächern sind in einem Protokoll festzuhalten. Das Ergebnis der Prüfung ist der Studentin im Anschluss an die mündliche Prüfung bekannt zu geben.

(9) Studentinnen, die sich in einem späteren Prüfungszeitraum der gleichen Prüfung unterziehen wollen, werden entsprechend den räumlichen Verhältnissen als Zuhörerinnen bei mündlichen Prüfungen zugelassen. Die Zulassung erstreckt sich nicht auf die Beratung und Bekanntgabe der Prüfungsergebnisse. Aus wichtigen Gründen oder auf Antrag der zu prüfenden Studentin ist die Zulassung zu versagen.

(10) Für Erfolgskontrollen anderer Art sind angemessene Bearbeitungsfristen einzuräumen und Abgabetermine festzulegen. Dabei ist durch die Art der Aufgabenstellung und durch entsprechende Dokumentation sicherzustellen, dass die erbrachte Studienleistung der Studentin zurechenbar ist. Die wesentlichen Gegenstände und Ergebnisse einer solchen Erfolgskontrolle sind in einem Protokoll festzuhalten.

(11) Schriftliche Arbeiten im Rahmen einer Erfolgskontrolle anderer Art haben dabei die folgende Erklärung zu tragen: „Ich versichere wahrheitsgemäß, die Arbeit selbstständig angefertigt, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde.“ Trägt die Arbeit diese Erklärung nicht, wird diese Arbeit nicht angenommen. Die wesentlichen Gegenstände und Ergebnisse einer solchen Erfolgskontrolle sind in einem Protokoll festzuhalten.

(12) Bei mündlich durchgeführten Erfolgskontrollen anderer Art muss in der Regel neben der Prüferin eine Beisitzende anwesend sein, die zusätzlich zur Prüferin die Protokolle zeichnet.

§ 7 Bewertung von Prüfungen und Erfolgskontrollen

(1) Das Ergebnis einer Erfolgskontrolle wird von den jeweiligen Prüferinnen in Form einer Note festgesetzt.

(2) Im Masterzeugnis dürfen nur folgende Noten verwendet werden:

1	=	sehr gut (very good)	=	eine hervorragende Leistung,
2	=	gut (good)	=	eine Leistung, die erheblich über den durchschnittlichen Anforderungen liegt,
3	=	befriedigend (satisfactory)	=	eine Leistung, die durchschnittlichen Anforderungen entspricht,

4	=	ausreichend (sufficient)	=	eine Leistung, die trotz ihrer Mängel noch den Anforderungen genügt,
5	=	nicht ausreichend (failed)	=	eine Leistung, die wegen erheblicher Mängel nicht den Anforderungen genügt.

Für die Masterarbeit und die Modulteilprüfungen sind zur differenzierten Bewertung nur folgende Noten zugelassen:

1	1.0, 1.3	=	sehr gut
2	1.7, 2.0, 2.3	=	gut
3	2.7, 3.0, 3.3	=	befriedigend
4	3.7, 4.0	=	ausreichend
5	4.7, 5.0	=	nicht ausreichend

Diese Noten müssen in den Protokollen und in den Anlagen (Transcript of Records und Diploma Supplement) verwendet werden.

(3) Für Erfolgskontrollen anderer Art kann im Studienplan die Benotung mit „bestanden" (passed) oder „nicht bestanden" (failed) vorgesehen werden.

(4) Bei der Bildung der gewichteten Durchschnitte der Modulnoten und der Gesamtnote wird nur die erste Dezimalstelle hinter dem Komma berücksichtigt; alle weiteren Stellen werden ohne Rundung gestrichen.

(5) Jedes Modul, jede Lehrveranstaltung und jede Erfolgskontrolle darf in demselben Studiengang nur einmal angerechnet werden. Die Anrechnung eines Moduls, einer Lehrveranstaltung oder einer Erfolgskontrolle ist darüber hinaus ausgeschlossen, wenn das betreffende Modul, die Lehrveranstaltung oder die Erfolgskontrolle bereits in einem grundständigen Bachelorstudiengang angerechnet wurde, auf dem dieser Masterstudiengang konsekutiv aufbaut.

(6) Erfolgskontrollen anderer Art dürfen in Modulteilprüfungen oder Modulprüfungen nur eingerechnet werden, wenn die Benotung nicht nach Absatz 3 erfolgt ist. Die zu dokumentierenden Erfolgskontrollen und die daran geknüpften Bedingungen werden im Studienplan festgelegt.

(7) Eine Modulteilprüfung ist bestanden, wenn die Note mindestens „ausreichend" (4.0) ist.

(8) Eine Modulprüfung ist dann bestanden, wenn die Modulnote mindestens „ausreichend" (4.0) ist. Die Modulprüfung und die Bildung der Modulnote werden im Studienplan geregelt. Die differenzierten Lehrveranstaltungsnoten (Absatz 2) sind bei der Berechnung der Modulnoten als Ausgangsdaten zu verwenden. Enthält der Studienplan keine Regelung darüber, wann eine Modulprüfung bestanden ist, so ist diese Modulprüfung dann endgültig nicht bestanden, wenn eine dem Modul zugeordnete Modulteilprüfung endgültig nicht bestanden wurde.

(9) Die Ergebnisse der Masterarbeit, der Modulprüfungen bzw. der Modulteilprüfungen, der Erfolgskontrollen anderer Art sowie die erworbenen Leistungspunkte werden durch das Studienbüro der Universität erfasst.

(10) Die Noten der Module eines Faches gehen in die Fachnote mit einem Gewicht proportional zu den ausgewiesenen Leistungspunkten der Module ein. Eine Fachprüfung ist bestanden, wenn die für das Fach erforderliche Anzahl von Leistungspunkten nachgewiesen wird.

(11) Die Gesamtnote der Masterprüfung und die Modulnoten lauten:

		bis	1.5	=	sehr gut
von	1.6	bis	2.5	=	gut
von	2.6	bis	3.5	=	befriedigend
von	3.6	bis	4.0	=	ausreichend

(12) Zusätzlich zu den Noten nach Absatz 2 werden ECTS-Noten für Fachprüfungen, Modulprüfungen und für die Masterprüfung nach folgender Skala vergeben:

ECTS-Note	Quote, Definition
A	gehört zu den besten 10 % der Studierenden, die die Erfolgskontrolle bestanden haben,
B	gehört zu den nächsten 25 % der Studierenden, die die Erfolgskontrolle bestanden haben,
C	gehört zu den nächsten 30 % der Studierenden, die die Erfolgskontrolle bestanden haben,
D	gehört zu den nächsten 25 % der Studierenden, die die Erfolgskontrolle bestanden haben,
E	gehört zu den letzten 10 % der Studierenden, die die Erfolgskontrolle bestanden haben,
FX	*nicht bestanden* (failed) - es sind Verbesserungen erforderlich, bevor die Leistungen anerkannt werden,
F	*nicht bestanden* (failed) - es sind erhebliche Verbesserungen erforderlich.

Die Quote ist als der Prozentsatz der erfolgreichen Studierenden definiert, die diese Note in der Regel erhalten. Dabei ist von einer mindestens fünfjährigen Datenbasis über mindestens 30 Studierende auszugehen. Für die Ermittlung der Notenverteilungen, die für die ECTS-Noten erforderlich sind, ist das Studienbüro der Universität zuständig. Bis zum Aufbau einer entsprechenden Datenbasis wird als Übergangsregel die Verteilung der Diplomsnoten des Diplomstudiengangs Wirtschaftsmathematik per 30. September 2009 zur Bildung dieser Skala für alle Module des Masterstudiengangs Wirtschaftsmathematik herangezogen. Diese Verteilung wird jährlich gleitend über mindestens fünf Semester mit mindestens 30 Studierenden jeweils zu Beginn des Semesters für jedes Modul, die Fachnoten und die Gesamtnote angepasst und in diesem Studienjahr für die Festsetzung der ECTS-Note verwendet.

§ 8 Erlöschen des Prüfungsanspruchs, Wiederholung von Prüfungen und Erfolgskontrollen

(1) Studentinnen können eine nicht bestandene schriftliche Prüfung (§ 4 Abs. 2, Nr. 1) einmal wiederholen. Wird eine schriftliche Wiederholungsprüfung mit „nicht ausreichend“ bewertet, so findet eine mündliche Nachprüfung im zeitlichen Zusammenhang mit dem Termin der nicht bestandenen Prüfung statt. In diesem Falle kann die Note dieser Prüfung nicht besser als „ausreichend“ (4.0) sein.

(2) Studentinnen können eine nicht bestandene mündliche Prüfung (§ 4 Abs. 2, Nr. 2) einmal wiederholen.

(3) Wiederholungsprüfungen nach Absatz 1 und 2 müssen in Inhalt, Umfang und Form (mündlich oder schriftlich) der ersten entsprechen. Ausnahmen kann der zuständige Prüfungsausschuss auf Antrag zulassen. Fehlversuche an anderen Hochschulen sind anzurechnen.

(4) Die Wiederholung einer Erfolgskontrolle anderer Art (§ 4 Abs. 2, Nr. 3) wird im Studienplan geregelt.

(5) Eine zweite Wiederholung derselben schriftlichen oder mündlichen Prüfung ist nur in Ausnahmefällen zulässig. Einen Antrag auf Zweitwiederholung hat die Studentin schriftlich beim Prüfungsausschuss zu stellen. Über den ersten Antrag einer Studentin auf Zweitwiederholung entscheidet der Prüfungsausschuss, wenn er den Antrag genehmigt. Wenn der Prüfungsausschuss diesen Antrag ablehnt, entscheidet die Rektorin. Über weitere Anträge auf Zweitwiederholung entscheidet nach Stellungnahme des Prüfungsausschusses die Rektorin. Absatz 1, Satz 2 und 3 gelten entsprechend.

(6) Die Wiederholung einer bestandenen Erfolgskontrolle ist nicht zulässig.

(7) Eine Fachprüfung ist endgültig nicht bestanden, wenn mindestens ein Modul des Faches endgültig nicht bestanden ist.

(8) Die Masterarbeit kann bei einer Bewertung mit „nicht ausreichend" einmal wiederholt werden. Eine zweite Wiederholung der Masterarbeit ist ausgeschlossen.

(9) Ist gemäß § 34 Abs. 2, Satz 3 LHG die Masterprüfung bis zum Ende des siebten Fachsemesters dieses Studiengangs einschließlich etwaiger Wiederholungen nicht vollständig abgelegt, so erlischt der Prüfungsanspruch im Studiengang, es sei denn, dass die Studentin die Fristüberschreitung nicht zu vertreten hat. Die Entscheidung darüber trifft der Prüfungsausschuss. Die Entscheidung über eine Fristverlängerung und über Ausnahmen von der Fristregelung trifft der Prüfungsausschuss.

§ 9 Versäumnis, Rücktritt, Täuschung, Ordnungsverstoß

(1) Die Studentin kann bei schriftlichen Modulprüfungen ohne Angabe von Gründen bis einen Tag (24 Uhr) vor dem Prüfungstermin zurücktreten (Abmeldung). Bei mündlichen Modulprüfungen muss der Rücktritt spätestens drei Werktage vor dem betreffenden Prüfungstermin erklärt werden (Abmeldung). Ein Rücktritt von einer mündlichen Prüfung weniger als drei Werktage vor dem betreffenden Prüfungstermin ist nur unter den Voraussetzungen des Absatzes 3 möglich. Die Abmeldung kann schriftlich bei der Prüferin oder per Online-Abmeldung beim Studienbüro erfolgen. Eine durch Widerruf abgemeldete Prüfung gilt als nicht angemeldet. Der Rücktritt von mündlichen Nachprüfungen im Sinne von § 8 Abs. 2 ist grundsätzlich nur unter den Voraussetzungen von Absatz 3 möglich.

(2) Eine Modulprüfung gilt als mit „nicht ausreichend" bewertet, wenn die Studentin einen Prüfungstermin ohne triftigen Grund versäumt oder wenn sie nach Beginn der Prüfung ohne triftigen Grund von der Prüfung zurücktritt. Dasselbe gilt, wenn die Masterarbeit nicht innerhalb der vorgesehenen Bearbeitungszeit erbracht wird, es sei denn, die Studentin hat die Fristüberschreitung nicht zu vertreten.

(3) Der für den Rücktritt nach Beginn der Prüfung oder das Versäumnis geltend gemachte Grund muss dem Prüfungsausschuss unverzüglich schriftlich angezeigt und glaubhaft gemacht werden. Bei Krankheit der Studentin bzw. eines von ihr allein zu versorgenden Kindes oder pflegebedürftigen Angehörigen kann die Vorlage eines ärztlichen Attestes und in Zweifelsfällen ein amtsärztliches Attest verlangt werden. Die Anerkennung des Rücktritts ist ausgeschlossen, wenn bis zum Eintritt des Hinderungsgrundes bereits Prüfungsleistungen erbracht worden sind und nach deren Ergebnis die Prüfung nicht bestanden werden kann. Wird der Grund anerkannt, wird ein neuer Termin anberaumt. Die bereits vorliegenden Prüfungsergebnisse sind in diesem Fall anzurechnen. Bei Modulprüfungen, die aus mehreren Prüfungen bestehen, werden die Prüfungsleistungen dieses Moduls, die bis zu einem anerkannten Rücktritt bzw. einem anerkannten Versäumnis einer Prüfungsleistung dieses Moduls erbracht worden sind, angerechnet.

(4) Versucht die Studentin das Ergebnis seiner Modulprüfung durch Täuschung oder Benutzung nicht zugelassener Hilfsmittel zu beeinflussen, gilt die betreffende Modulprüfung als mit „nicht ausreichend" (5.0) bewertet.

(5) Eine Studentin, die den ordnungsgemäßen Ablauf der Prüfung stört, kann von der jeweiligen Prüferin oder Aufsicht Führenden von der Fortsetzung der Modulprüfung ausgeschlossen werden. In diesem Fall gilt die betreffende Prüfungsleistung als mit „nicht ausreichend" (5.0) bewertet. In schwerwiegenden Fällen kann der Prüfungsausschuss die Studentin von der Erbringung weiterer Prüfungsleistungen ausschließen.

(6) Die Studentin kann innerhalb einer Frist von einem Monat verlangen, dass Entscheidungen gemäß Absatz 4 und 5 vom Prüfungsausschuss überprüft werden. Belastende Entscheidungen des Prüfungsausschusses sind der Studentin unverzüglich schriftlich mitzuteilen. Sie sind zu begründen und mit einer Rechtsbehelfsbelehrung zu versehen. Der Studentin ist vor einer Entscheidung Gelegenheit zur Äußerung zu geben.

(7) Näheres regelt die Allgemeine Satzung der Universität Karlsruhe (TH) zur Redlichkeit bei Prüfungen und Praktika (‚Verhaltensordnung').

§ 10 Mutterschutz, Elternzeit, Wahrnehmung von Familienpflichten

(1) Auf Antrag sind die Mutterschutzfristen, wie sie im jeweils gültigen Gesetz zum Schutz der erwerbstätigen Mutter (MuSchG) festgelegt sind, entsprechend zu berücksichtigen. Dem Antrag sind die erforderlichen Nachweise beizufügen. Die Mutterschutzfristen unterbrechen jede Frist nach dieser Prüfungsordnung. Die Dauer des Mutterschutzes wird nicht in die Frist eingerechnet.

(2) Gleichfalls sind die Fristen der Elternzeit nach Maßgabe des jeweiligen gültigen Gesetzes (BErzGG) auf Antrag zu berücksichtigen. Die Studentin muss bis spätestens vier Wochen vor dem Zeitpunkt, von dem an sie die Elternzeit antreten will, dem Prüfungsausschuss unter Beifügung der erforderlichen Nachweise schriftlich mitteilen, in welchem Zeitraum sie Elternzeit in Anspruch nehmen will. Der Prüfungsausschuss hat zu prüfen, ob die gesetzlichen Voraussetzungen vorliegen, die bei einer Arbeitnehmerin den Anspruch auf Elternzeit auslösen würden, und teilt der Studentin das Ergebnis sowie die neu festgesetzten Prüfungszeiten unverzüglich mit. Die Bearbeitungszeit der Masterarbeit kann nicht durch Elternzeit unterbrochen werden. Die gestellte Arbeit gilt als nicht vergeben. Nach Ablauf der Elternzeit erhält die Studentin ein neues Thema.

(3) Der Prüfungsausschuss entscheidet auf Antrag über die flexible Handhabung von Prüfungsfristen entsprechend den Bestimmungen des Landeshochschulgesetzes, wenn Studierende Familienpflichten wahrzunehmen haben. Die Bearbeitungszeit der Masterarbeit kann nicht durch die Wahrnehmung von Familienpflichten unterbrochen oder verlängert werden. Die gestellte Arbeit gilt als nicht vergeben. Die Studentin erhält ein neues Thema, das innerhalb der in § 11 festgelegten Bearbeitungszeit zu bearbeiten ist.

§ 11 Masterarbeit

(1) Die Masterarbeit soll zeigen, dass die Studentin in der Lage ist, ein Problem aus ihrem Fach selbstständig und in begrenzter Zeit nach wissenschaftlichen Methoden, die dem Stand der Forschung entsprechen, zu bearbeiten. Die Masterarbeit kann auf Deutsch oder Englisch geschrieben werden.

(2) Zum Modul Masterarbeit wird zugelassen, wer mindestens 70 Leistungspunkte gesammelt hat.

(3) Die Masterarbeit kann von jeder Prüferin nach § 15 Abs. 2 aus den Fakultäten für Mathematik oder Wirtschaftswissenschaften vergeben werden. Soll die Masterarbeit außerhalb der Fakultäten für Mathematik oder Wirtschaftswissenschaften angefertigt werden, so bedarf dies der Genehmigung des Prüfungsausschusses. Der Studentin ist Gelegenheit zu geben, für das Thema Vorschläge zu machen. Auf Antrag der Studentin sorgt ausnahmsweise die Vorsitzende des Prüfungsausschusses dafür, dass die Studentin innerhalb von vier Wochen nach Antragstellung von einer Betreuerin ein Thema für die Masterarbeit erhält. Die Ausgabe des Themas erfolgt in diesem Fall über die Vorsitzende des Prüfungsausschusses.

(4) Der Masterarbeit werden 30 Leistungspunkte zugeordnet. Die Bearbeitungsdauer beträgt sechs Monate. Thema, Aufgabenstellung und Umfang der Masterarbeit sind von der Betreuerin so zu begrenzen, dass sie mit dem in Satz 1 festgelegten Arbeitsaufwand bearbeitet werden kann. Auf begründeten Antrag der Studentin kann der Prüfungsausschuss diesen Zeitraum um höchstens drei Monate verlängern.

(5) Bei der Abgabe der Masterarbeit hat die Studentin schriftlich zu versichern, dass sie die Arbeit selbstständig verfasst hat und keine anderen als die von ihr angegebenen Quellen und Hilfsmittel benutzt hat, die wörtlich oder inhaltlich übernommenen Stellen als solche kenntlich gemacht und die Satzung der Universität Karlsruhe (TH) zur Sicherung guter wissenschaftlicher Praxis in der jeweils gültigen Fassung beachtet hat. Wenn diese Erklärung nicht enthalten ist, wird die Arbeit nicht angenommen. Bei Abgabe einer unwahren Versicherung wird die Masterarbeit mit „nicht ausreichend“ (5.0) bewertet.

(6) Der Zeitpunkt der Ausgabe des Themas der Masterarbeit und der Zeitpunkt der Abgabe der Masterarbeit sind aktenkundig zu machen. Die Studentin kann das Thema der Masterarbeit nur einmal und nur innerhalb der ersten zwei Monate der Bearbeitungszeit zurückgeben. Wird die Masterarbeit nicht fristgerecht abgeliefert, gilt sie als mit „nicht ausreichend“ bewertet, es sei denn, dass die Studentin dieses Versäumnis nicht zu vertreten hat. Die Möglichkeit der Wiederholung wird in § 8 geregelt.

(7) Die Masterarbeit wird von einer Betreuerin sowie in der Regel von einer weiteren Prüferin aus den beteiligten Fakultäten begutachtet und bewertet. Eine der beiden muss Hochschullehrerin sein. Bei nicht übereinstimmender Beurteilung der beiden Prüferinnen setzt der Prüfungsausschuss im Rahmen der Bewertung der beiden Prüferinnen die Note der Masterarbeit fest. Der Bewertungszeitraum soll acht Wochen nicht überschreiten.

§ 12 Berufspraktikum

(1) Die Studentin kann während des Masterstudiums ein Berufspraktikum ableisten, welches geeignet ist, der Studentin eine Anschauung von der Verzahnung mathematischer und wirtschaftswissenschaftlicher Sichtweisen zu vermitteln. Dem Berufspraktikum sind 8 Leistungspunkte zugeordnet.

(2) Die Studentin setzt sich in eigener Verantwortung mit geeigneten privaten bzw. öffentlichen Einrichtungen in Verbindung, an denen das Praktikum abgeleistet werden kann. Die Studentin wird dabei von einer Prüferin nach § 15 Abs. 2 und einer Ansprechpartnerin der betroffenen Einrichtung betreut.

(3) Am Ende des Berufspraktikums ist der Prüferin ein kurzer Bericht abzugeben und eine Kurzpräsentation über die Erfahrungen im Berufspraktikum zu halten.

(4) Das Berufspraktikum ist abgeschlossen, wenn eine mindestens sechswöchige Tätigkeit nachgewiesen wird, der Bericht abgegeben und die Kurzpräsentation gehalten wurde. Das Berufspraktikum geht nicht in die Gesamtnote ein. Ein Berufspraktikum kann als Zusatzleistung im Sinne von § 13 Abs. 1 oder im Rahmen des Wahlpflichtfachs gemäß § 17 Abs. 4 erbracht werden.

§ 13 Zusatzleistungen, Zusatzmodule, Schlüsselqualifikationen

(1) Innerhalb der Regelstudienzeit, einschließlich der Urlaubssemester für das Studium an einer ausländischen Hochschule (Regelprüfungszeit), können in einem Modul bzw. Fach auch weitere Leistungspunkte (Zusatzleistungen) im Umfang von höchstens 20 Leistungspunkten pro Studiengang erworben werden. § 3 und § 4 der Prüfungsordnung bleiben davon unberührt. Diese Zusatzleistungen gehen nicht in die Festsetzung der Gesamt-, Fach- und Modulnoten ein. Die bei der Festlegung der Modul- bzw. Fachnote nicht berücksichtigten Leistungspunkte werden als Zusatzleistungen automatisch im Transcript of Records aufgeführt und als Zusatzleistungen gekennzeichnet. Zusatzleistungen werden mit den nach § 7 vorgesehenen Noten gelistet.

(2) Die Studentin hat bereits bei der Anmeldung zu einer Prüfung in einem Modul diese als Zusatzleistung zu deklarieren.

(3) Die Ergebnisse maximal zweier Module, die jeweils mindestens 9 Leistungspunkte umfassen müssen, werden auf Antrag der Studentin in das Bachelorzeugnis als Zusatzmodule aufgenommen und als Zusatzmodule gekennzeichnet. Zusatzmodule werden bei der Festsetzung der Gesamtnote nicht mit einbezogen. Nicht in das Zeugnis aufgenommene Zusatzmodule werden im Transcript of Records automatisch aufgenommen und als Zusatzmodule gekennzeichnet. Zusatzmodule werden mit den nach § 7 vorgesehenen Noten gelistet.

(4) Neben den verpflichtenden fachwissenschaftlichen Modulen sind Module zu den überfachlichen Schlüsselqualifikationen im Umfang von 3 bis 4 Leistungspunkten Bestandteil eines Masterstudiums. Im Studienplan werden Empfehlungen ausgesprochen, welche Module im Rahmen des Angebots zur Vermittlung der additiven Schlüsselqualifikationen belegt werden sollen.

§ 14 Prüfungsausschuss

(1) Für den Masterstudiengang Wirtschaftsmathematik wird ein Prüfungsausschuss gebildet. Er besteht aus sechs stimmberechtigten Mitgliedern, die jeweils zur Hälfte von der Fakultät für Mathematik und der Fakultät für Wirtschaftswissenschaften bestellt werden: vier Hochschullehrerinnen oder Privatdozentinnen, zwei Vertreterinnen der Gruppe der akademischen Mitarbeiterinnen nach § 10 Abs. 1, Satz 2, Nr. 2 LHG und einer Vertreterin der Studentinnen der Fakultät für Mathematik mit beratender Stimme. Weitere Mitglieder mit beratender Stimme können von den jeweiligen Fakultätsräten bestellt werden. Die Amtszeit der nichtstudentischen Mitglieder beträgt zwei Jahre, die des studentischen Mitglieds ein Jahr.

(2) Die Vorsitzende, ihre Stellvertreterin, die weiteren Mitglieder des Prüfungsausschusses sowie deren Stellvertreterinnen werden von den jeweiligen Fakultätsräten bestellt, die Mitglieder der Gruppe der akademischen Mitarbeiterinnen nach § 10 Abs. 1, Satz 2, Nr. 2 LHG und die Vertreterin der Studentinnen auf Vorschlag der Mitglieder der jeweiligen Gruppe; Wiederbestellung ist möglich. Die Vorsitzende und deren Stellvertreterin müssen Hochschullehrerin sein. Die Vorsitzende des Prüfungsausschusses nimmt die laufenden Geschäfte wahr.

(3) Der Prüfungsausschuss ist zuständig für die Organisation der Modulprüfungen und die Durchführung der ihm durch diese Studien- und Prüfungsordnung zugewiesenen Aufgaben. Er achtet auf die Einhaltung der Bestimmungen dieser Studien- und Prüfungsordnung und fällt die Entscheidung in Prüfungsangelegenheiten. Er entscheidet über die Anrechnung von Studienzeiten, Studienleistungen und Modulprüfungen und übernimmt die Gleichwertigkeitsfeststellung. Er berichtet der jeweiligen Fakultät regelmäßig über die Entwicklung der Prüfungs- und Studienzeiten, einschließlich der Bearbeitungszeiten für die Masterarbeiten und die Verteilung der Gesamtnoten. Er gibt Anregungen zur Reform der Studien- und Prüfungsordnung und der Modulbeschreibungen.

(4) Der Prüfungsausschuss kann die Erledigung seiner Aufgaben für alle Regelfälle auf die Vorsitzende des Prüfungsausschusses übertragen.

(5) Die Mitglieder des Prüfungsausschusses haben das Recht, der Abnahme von Prüfungen beizuwohnen. Die Mitglieder des Prüfungsausschusses, die Prüferinnen und die Beisitzenden unterliegen der Amtsverschwiegenheit. Sofern sie nicht im öffentlichen Dienst stehen, sind sie durch die Vorsitzende zur Verschwiegenheit zu verpflichten.

(6) In Angelegenheiten des Prüfungsausschusses, die eine an einer anderen Fakultät zu absolvierende Prüfungsleistung betreffen, ist auf Antrag eines Mitgliedes des Prüfungsausschusses eine fachlich zuständige und von der betroffenen Fakultät zu nennende Hochschullehrerin oder Privatdozentin hinzuzuziehen. Sie hat in diesem Punkt Stimmrecht.

(7) Belastende Entscheidungen des Prüfungsausschusses sind der Studentin schriftlich mitzuteilen. Sie sind zu begründen und mit einer Rechtsbehelfsbelehrung zu versehen. Widersprüche gegen Entscheidungen des Prüfungsausschusses sind innerhalb eines Monats nach Zugang der Entscheidung schriftlich oder zur Niederschrift beim Rektorat der Universität Karlsruhe (TH) einzulegen.

§ 15 Prüferinnen und Beisitzende

(1) Der Prüfungsausschuss bestellt die Prüferinnen und die Beisitzenden. Er kann die Bestellung der Vorsitzenden übertragen.

(2) Prüferinnen sind Hochschullehrerinnen und habilitierte Mitglieder sowie akademischen Mitarbeiterinnen, denen die Prüfungsbefugnis übertragen wurde. Zur Prüferin und Beisitzenden darf nur bestellt werden, wer mindestens die dem jeweiligen Prüfungsgegenstand entsprechende fachwissenschaftliche Qualifikation erworben hat.

(3) Soweit Lehrveranstaltungen von anderen als den unter Absatz 2 genannten Personen durchgeführt werden, sollen diese zu Prüferinnen bestellt werden, wenn die jeweilige Fakultät ihnen eine diesbezügliche Prüfungsbefugnis erteilt hat.

(4) Zur Beisitzenden darf nur bestellt werden, wer einen Masterabschluss in einem Studiengang der Wirtschaftsmathematik oder einen gleichwertigen akademischen Abschluss erworben hat.

§ 16 Anrechnung von Studienzeiten, Anerkennung von Studienleistungen und Modulprüfungen

(1) Studienzeiten und Studienleistungen und Modulprüfungen, die in gleichen oder anderen Studiengängen an der Universität Karlsruhe (TH) oder an anderen Hochschulen erbracht wurden, werden angerechnet, soweit Gleichwertigkeit besteht. Gleichwertigkeit ist festzustellen, wenn Leistungen in Inhalt, Umfang und in den Anforderungen denjenigen des Studiengangs im Wesentlichen entsprechen. Dabei ist kein schematischer Vergleich, sondern eine Gesamtbetrachtung vorzunehmen. Bezüglich des Umfangs einer zur Anerkennung vorgelegten Studienleistung und Modulprüfung werden die Grundsätze des ECTS herangezogen; die inhaltliche Gleichwertigkeitsprüfung orientiert sich an den Qualifikationszielen des Moduls.

(2) Werden Leistungen angerechnet, können die Noten – soweit die Notensysteme vergleichbar sind – übernommen werden und in die Berechnung der Modulnoten und der Gesamtnote einbezogen werden. Liegen keine Noten vor, muss die Leistung nicht anerkannt werden. Die Studentin hat die für die Anrechnung erforderlichen Unterlagen vorzulegen.

(3) Bei der Anrechnung von Studienzeiten und der Anerkennung von Studienleistungen und Modulprüfungen, die außerhalb der Bundesrepublik erbracht wurden, sind die von der Kultusministerkonferenz und der Hochschulrektorenkonferenz gebilligten Äquivalenzvereinbarungen sowie Absprachen im Rahmen der Hochschulpartnerschaften zu beachten.

(4) Absatz 1 gilt auch für Studienzeiten, Studienleistungen und Modulprüfungen, die in staatlich anerkannten Fernstudien- und an anderen Bildungseinrichtungen, insbesondere an staatlichen oder staatlich anerkannten Berufsakademien erworben wurden.

(5) Die Anerkennung von Teilen der Masterprüfung kann versagt werden, wenn in einem Studiengang mehr als die Hälfte aller Erfolgskontrollen und/oder in einem Studiengang mehr als die Hälfte der erforderlichen Leistungspunkte und/oder die Masterarbeit anerkannt werden soll/en. Dies gilt insbesondere bei einem Studiengangwechsel sowie bei einem Studienortwechsel.

(6) Zuständig für die Anrechnungen ist der Prüfungsausschuss. Vor Feststellungen über die Gleichwertigkeit sind die zuständigen Fachvertreterinnen zu hören. Der Prüfungsausschuss entscheidet in Abhängigkeit von Art und Umfang der anzurechnenden Studien- und Prüfungsleistungen über die Einstufung in ein höheres Fachsemester.

II. Masterprüfung

§ 17 Umfang und Art der Masterprüfung

(1) Die Masterprüfung besteht aus den Prüfungen nach Absatz 2, 3 und 4 sowie der Masterarbeit nach Absatz 6.

(2) Es sind Prüfungen aus folgenden Gebieten durch den Nachweis von Leistungspunkten in jeweils einem oder mehreren Modulen abzulegen:

Fach Mathematik:

1. Stochastik: im Umfang von 8 Leistungspunkten,
2. Angewandte und Numerische Mathematik/Optimierung: im Umfang von 8 Leistungspunkten,
3. Analysis: im Umfang von 8 Leistungspunkten.

Des Weiteren sind Prüfungen aus den mathematischen Gebieten Stochastik, Angewandte und Numerische Mathematik/Optimierung, Analysis oder Algebra und Geometrie der Fakultät für Mathematik im Umfang von 12 Leistungspunkten abzulegen.

Fach Wirtschaftswissenschaften:

4. Finance - Risikomanagement - Managerial Economics: im Umfang von 18 Leistungspunkten,

5. Operations Management - Datenanalyse - Informatik: im Umfang von 18 Leistungspunkten.

Die Module, die ihnen zugeordneten Leistungspunkte und die Zuordnung der Module zu den Gebieten und Fächern sind im Studienplan festgelegt. Zur entsprechenden Modulprüfung kann nur zugelassen werden, wer die Anforderungen nach § 5 erfüllt.

(3) Es sind zwei Seminarmodule über je 3 Leistungspunkte nachzuweisen. Dabei muss je ein Seminarmodul aus den beiden beteiligten Fakultäten bestanden werden.

(4) Es sind weiterhin 12 Leistungspunkte zu erbringen, wobei mindestens 8 Leistungspunkte aus den obigen Gebieten 1.-5. oder dem Berufspraktikum kommen müssen und 3 bis 4 Leistungspunkte aus Modulen zu Schlüsselqualifikationen nach § 13 Abs. 4.

(5) Im Studienplan oder Modulhandbuch können darüber hinaus inhaltliche Schwerpunkte definiert werden, denen Module zugeordnet werden können.

(6) Als weitere Prüfungsleistung ist eine Masterarbeit gemäß § 11 anzufertigen.

§ 18 Bestehen der Masterprüfung, Bildung der Gesamtnote

(1) Die Masterprüfung ist bestanden, wenn alle in § 17 genannten Prüfungsleistungen mindestens mit „ausreichend“ bewertet wurden.

(2) Die Gesamtnote der Masterprüfung errechnet sich als ein mit Leistungspunkten gewichteter Notendurchschnitt. Dabei werden alle Prüfungsleistungen nach § 17 mit ihren Leistungspunkten gewichtet.

(3) Hat die Studentin die Masterarbeit mit der Note 1.0 und die Masterprüfung mit einem Durchschnitt von 1.0 abgeschlossen, so wird das Prädikat „mit Auszeichnung“ (with distinction) verliehen. Mit einer Masterarbeit mit der Note 1.0 und bis zu einem Durchschnitt von 1.3 kann auf Antrag an den Prüfungsausschuss das Prädikat „mit Auszeichnung“ (with distinction) verliehen werden.

§ 19 Masterzeugnis, Masterurkunde, Transcript of Records und Diploma Supplement

(1) Über die Masterprüfung werden nach Bewertung der letzten Prüfungsleistung eine Masterurkunde und ein Zeugnis erstellt. Die Ausfertigung von Masterurkunde und Zeugnis soll nicht später als sechs Wochen nach der Bewertung der letzten Prüfungsleistung erfolgen. Masterurkunde und Masterzeugnis werden in deutscher und englischer Sprache ausgestellt. Masterurkunde und Zeugnis tragen das Datum der erfolgreichen Erbringung der letzten Prüfungsleistung. Sie werden der Studentin gleichzeitig ausgehändigt. In der Masterurkunde wird die Verleihung des akademischen Mastergrades beurkundet. Die Masterurkunde wird von der Rektorin und der Dekanin unterzeichnet und mit dem Siegel der Universität versehen.

(2) Das Zeugnis enthält die in den Fachprüfungen, den zugeordneten Modulprüfungen und der Masterarbeit erzielten Noten, deren zugeordnete Leistungspunkte und ECTS-Noten und die Gesamtnote und die ihr entsprechende ECTS-Note. Das Zeugnis ist von den Dekaninnen der beteiligten Fakultäten und von der Vorsitzenden des Prüfungsausschusses zu unterzeichnen.

(3) Weiterhin erhält die Studentin als Anhang ein Diploma Supplement in deutscher und englischer Sprache, das den Vorgaben des jeweils gültigen ECTS User's Guide entspricht. Das Diploma Supplement enthält eine Abschrift der Studiendaten der Studentin (Transcript of Records).

(4) Die Abschrift der Studiendaten (Transcript of Records) enthält in strukturierter Form alle von der Studentin erbrachten Prüfungsleistungen. Sie beinhaltet alle Fächer, Fachnoten und ihre entsprechende ECTS-Note samt den zugeordneten Leistungspunkten, die dem jeweiligen Fach zugeordneten Module mit den Modulnoten, entsprechender ECTS-Note und zugeordneten Leistungspunkten sowie die den Modulen zugeordneten Lehrveranstaltungen samt Noten und zugeordneten Leistungspunkten. Aus der Abschrift der Studiendaten soll die Zugehörigkeit von Lehrveranstaltungen zu den einzelnen Modulen und die Zugehörigkeit der Module zu den einzelnen Fächern deutlich erkennbar sein. Angerechnete Studienleistungen sind im Transcript of Records aufzunehmen.

(5) Die Masterurkunde, das Masterzeugnis und das Diploma Supplement einschließlich des Transcript of Records werden vom Studienbüro der Universität ausgestellt.

III. Schlussbestimmungen

§ 20 Bescheid über Nicht-Bestehen, Bescheinigung von Prüfungsleistungen

(1) Der Bescheid über die endgültig nicht bestandene Masterprüfung wird der Studentin durch den Prüfungsausschuss in schriftlicher Form erteilt. Der Bescheid ist mit einer Rechtsbehelfsbelehrung zu versehen.

(2) Hat die Studentin die Masterprüfung endgültig nicht bestanden, wird ihr auf Antrag und gegen Vorlage der Exmatrikulationsbescheinigung eine schriftliche Bescheinigung ausgestellt, die die erbrachten Prüfungsleistungen und deren Noten sowie die zur Prüfung noch fehlenden Prüfungsleistungen enthält und erkennen lässt, dass die Prüfung insgesamt nicht bestanden ist. Dasselbe gilt, wenn der Prüfungsanspruch erloschen ist.

§ 21 Ungültigkeit der Masterprüfung, Entziehung des Mastergrades

(1) Hat die Studentin bei einer Prüfungsleistung getäuscht und wird diese Tatsache nach der Aushändigung des Zeugnisses bekannt, so können die Noten der Modulprüfungen, bei deren Erbringung die Studentin getäuscht hat, berichtigt werden. Gegebenenfalls kann die Modulprüfung für „nicht ausreichend“ (5.0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(2) Waren die Voraussetzungen für die Zulassung zu einer Prüfung nicht erfüllt, ohne dass die Studentin darüber täuschen wollte, und wird diese Tatsache erst nach Aushändigung des Zeugnisses bekannt, wird dieser Mangel durch das Bestehen der Prüfung geheilt. Hat die Studentin die Zulassung vorsätzlich zu Unrecht erwirkt, so kann die Modulprüfung für „nicht ausreichend“ (5.0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(3) Vor einer Entscheidung des Prüfungsausschusses ist der Studentin Gelegenheit zur Äußerung zu geben.

(4) Das unrichtige Zeugnis ist zu entziehen und gegebenenfalls ein neues zu erteilen. Mit dem unrichtigen Zeugnis ist auch die Masterurkunde einzuziehen, wenn die Masterprüfung aufgrund einer Täuschung für „nicht bestanden“ erklärt wurde.

(5) Eine Entscheidung nach Absatz 1 und Absatz 2 Satz 2 ist nach einer Frist von fünf Jahren ab dem Datum des Zeugnisses ausgeschlossen.

(6) Die Aberkennung des akademischen Grades richtet sich nach den gesetzlichen Vorschriften.

§ 22 Einsicht in die Prüfungsakten

(1) Nach Abschluss der Masterprüfung wird der Studentin auf Antrag innerhalb eines Jahres Einsicht in ihre Masterarbeit, die darauf bezogenen Gutachten und in die Prüfungsprotokolle gewährt.

(2) Für die Einsichtnahme in die schriftlichen Modulprüfungen, schriftlichen Modulteilprüfungen bzw. Prüfungsprotokolle gilt eine Frist von einem Monat nach Bekanntgabe des Prüfungsergebnisses.

(3) Die Prüferin bestimmt Ort und Zeit der Einsichtnahme.

(4) Prüfungsunterlagen sind mindestens fünf Jahre aufzubewahren.

§ 23 In-Kraft-Treten

(1) Diese Studien- und Prüfungsordnung tritt am 1. Oktober 2009 in Kraft.

(2) Studierende, die auf Grundlage der Prüfungsordnung der Universität Karlsruhe (TH) für den Diplomstudiengang Wirtschaftsmathematik vom 15. November 2001 (Amtliche Bekanntmachung der Universität Karlsruhe (TH) Nr. 30 vom 26. November 2001) in der Fassung der Änderungssatzung vom 10. September 2003 (Amtliche Bekanntmachung der Universität Karlsruhe (TH) Nr. 28 vom 20. Oktober 2003) ihr Studium an der Universität Karlsruhe (TH) aufgenommen haben, können einen Antrag auf Zulassung zur Prüfung letztmalig am 30. September 2020 stellen.

Karlsruhe, den 28. August 2009

Professor Dr. sc. tech. Horst Hippler
(Rektor)

Satzung zur Änderung der Studien- und Prüfungsordnung des Karlsruher Instituts für Technologie (KIT) für den Masterstudiengang Wirtschaftsmathematik

vom 24. September 2012

Aufgrund von § 10 Abs. 2 Ziff. 5 und § 20 des Gesetzes über das Karlsruher Institut für Technologie (KIT-Gesetz - KITG) in der Fassung vom 14. Juli 2009 (GBl. S. 317 f.), zuletzt geändert durch Artikel 5 des Gesetzes zur Einführung einer Verfassten Studierendenschaft und zur Stärkung der akademischen Weiterbildung (Verfasste-Studierendenschafts-Gesetz – VerfStudG) in der Fassung vom 10. Juli 2012 (GBl. S. 457, 464), und § 8 Abs. 5 und § 34 Abs. 1 des Gesetzes über die Hochschulen in Baden-Württemberg (Landeshochschulgesetz - LHG) in der Fassung vom 1. Januar 2005 (GBl. S. 1 f.), zuletzt geändert durch Artikel 2 des Gesetzes zur Einführung einer Verfassten Studierendenschaft und zur Stärkung der akademischen Weiterbildung (Verfasste-Studierendenschafts-Gesetz – VerfStudG) in der Fassung vom 10. Juli 2012 (GBl. S. 457 ff.), hat der Senat des Karlsruher Instituts für Technologie (KIT) am 16. Juli 2012 die folgende Satzung zur Änderung der Studien- und Prüfungsordnung für den Masterstudiengang Wirtschaftsmathematik vom 28. August 2009 (Amtliche Bekanntmachung des Karlsruher Instituts für Technologie (KIT) Nr. 76 vom 28. August 2009) beschlossen.

Der Präsident hat seine Zustimmung am 24. September 2012 erklärt.

Artikel 1

1. § 7 Abs. 12 wird ersatzlos gestrichen.

2. § 13 Abs. 1 wird wie folgt geändert:

   „**(1)** In einem Modul bzw. Fach können auch weitere Leistungspunkte (Zusatzleistungen) im Umfang von höchstens 20 Leistungspunkten aus dem Gesamtangebot des KIT erworben werden. § 3 und § 4 der Prüfungsordnung bleiben davon unberührt. Diese Zusatzleistungen gehen nicht in die Festsetzung der Gesamt-, Fach- und Modulnoten ein. Die bei der Festlegung der Modul- bzw. Fachnote nicht berücksichtigten Leistungspunkte werden als Zusatzleistungen automatisch im Transcript of Records aufgeführt und als Zusatzleistungen gekennzeichnet. Zusatzleistungen werden mit den nach § 7 vorgesehenen Noten gelistet.“

3. § 13 Abs. 3 erhält folgende Fassung:

   „**(3)** Die Ergebnisse maximal dreier Module, die insgesamt nur maximal 20 Leistungspunkte umfassen dürfen, werden auf Antrag der Studentin in das Masterzeugnis als Zusatzmodule aufgenommen und als Zusatzmodule gekennzeichnet. Zusatzmodule werden bei der Festsetzung der Gesamtnote nicht mit einbezogen. Nicht in das Zeugnis aufgenommene Zusatzmodule werden im Transcript of Records automatisch aufgenommen und als Zusatzmodule gekennzeichnet. Zusatzmodule werden mit den nach § 7 vorgesehenen Noten gelistet.“

4. § 14 Abs. 1 erhält folgende Fassung:

   „**(1)** Für den Masterstudiengang Wirtschaftsmathematik wird ein Prüfungsausschuss gebildet. Er besteht aus sechs stimmberechtigten Mitgliedern, die jeweils zur Hälfte von der Fakultät für Mathematik und der Fakultät für Wirtschaftswissenschaften bestellt werden: vier Hochschullehrerinnen oder Privatdozentinnen, zwei Vertreterinnen der Gruppe der akademischen Mitarbeiterinnen nach § 10 Abs. 1, Satz 2, Nr. 2 LHG und je einer Vertreterin der Studentinnen der Fakultät für Mathematik und der Fakultät für Wirtschaftswissenschaften mit beratender

Stimme. Weitere Mitglieder mit beratender Stimme können von den jeweiligen Fakultätsräten bestellt werden. Die Amtszeit der nichtstudentischen Mitglieder beträgt zwei Jahre, die der studentischen Mitglieder ein Jahr.“

5. § 17 Abs. 2 wird wie folgt geändert:

   „**(2)** Es sind Prüfungen aus folgenden Gebieten durch den Nachweis von Leistungspunkten in jeweils einem oder mehreren Modulen abzulegen:

   Fach Mathematik:

   1. Stochastik: im Umfang von 8 Leistungspunkten,
   2. Angewandte und Numerische Mathematik/Optimierung oder Analysis: im Umfang von 8 Leistungspunkten.

   Des Weiteren sind Prüfungen aus den mathematischen Gebieten Stochastik, Angewandte und Numerische Mathematik/Optimierung, Analysis oder Algebra und Geometrie der Fakultät für Mathematik im Umfang von 20 Leistungspunkten abzulegen.

   Fach Wirtschaftswissenschaften:

   3. Finance – Risk Management - Managerial Economics: im Umfang von 18 Leistungspunkten,
   4. Operations Management - Datenanalyse - Informatik: im Umfang von 18 Leistungspunkten.

   Die Module, die ihnen zugeordneten Leistungspunkte und die Zuordnung der Module zu den Gebieten und Fächern sind im Studienplan festgelegt. Zur entsprechenden Modulprüfung kann nur zugelassen werden, wer die Anforderungen nach § 5 erfüllt.“

6. § 19 Abs. 2 erhält folgende Fassung:

   „**(2)** Das Zeugnis enthält die in den Fachprüfungen, den zugeordneten Modulprüfungen und der Masterarbeit erzielten Noten, deren zugeordnete Leistungspunkte und die Gesamtnote. Das Zeugnis ist von den Dekaninnen der beteiligten Fakultäten und von der Vorsitzenden des Prüfungsausschusses zu unterzeichnen.“

7. § 19 Abs. 4 wird wie folgt geändert:

   „**(4)** Die Abschrift der Studiendaten (Transcript of Records) enthält in strukturierter Form alle von der Studentin erbrachten Prüfungsleistungen. Sie beinhaltet alle Fächer, Fachnoten samt den zugeordneten Leistungspunkten, die dem jeweiligen Fach zugeordneten Module mit den Modulnoten und zugeordneten Leistungspunkten sowie die den Modulen zugeordneten Lehrveranstaltungen samt Noten und zugeordneten Leistungspunkten. Aus der Abschrift der Studiendaten soll die Zugehörigkeit von Lehrveranstaltungen zu den einzelnen Modulen und die Zugehörigkeit der Module zu den einzelnen Fächern deutlich erkennbar sein. Angerechnete Studienleistungen sind im Transcript of Records aufzunehmen.“

Artikel 2

Diese Satzung tritt am Tage nach ihrer Veröffentlichung in den Amtlichen Bekanntmachungen des Karlsruher Instituts für Technologie (KIT) in Kraft.

Karlsruhe, den 24. September 2012

Professor Dr. Eberhard Umbach
(Präsident)

Studien- und Prüfungsordnung des Karlsruher Instituts für Technologie (KIT) für den Masterstudiengang Wirtschaftsmathematik

vom 17.12.2015

Aufgrund von § 10 Absatz 2 Ziff. 5 und § 20 des Gesetzes über das Karlsruher Institut für Technologie (KIT-Gesetz - KITG) in der Fassung vom 14. Juli 2009 (GBl. S. 317 f), zuletzt geändert durch Artikel 5 des Dritten Gesetzes zur Änderung hochschulrechtlicher Vorschriften (3. Hochschulrechtsänderungsgesetz – 3. HRÄG) vom 01. April 2014 (GBl. S. 99, 167) und § 8 Absatz 5 des Gesetzes über die Hochschulen in Baden-Württemberg (Landeshochschulgesetz - LHG) in der Fassung vom 1. Januar 2005 (GBl. S. 1 f), zuletzt geändert durch Artikel 1 des 3. HRÄG vom 01. April 2014 (GBl. S. 99 ff.), hat der Senat des KIT am 14.12.2015 die folgende Studien- und Prüfungsordnung für den Masterstudiengang Wirtschaftsmathematik beschlossen.

Der Präsident hat seine Zustimmung gemäß § 20 Absatz 2 KITG iVm. § 32 Absatz 3 Satz 1 LHG am 17. Dezember 2015 erteilt.

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Präambel

Das KIT hat sich im Rahmen der Umsetzung des Bolognaprozesses zum Aufbau eines europäischen Hochschulraumes zum Ziel gesetzt, dass am Abschluss des Studiums am KIT der Mastergrad stehen soll. Das KIT sieht daher die am KIT angebotenen konsekutiven Bachelor- und Masterstudiengänge als Gesamtkonzept mit konsekutivem Curriculum.

I. Allgemeine Bestimmungen

§ 1 Geltungsbereich

Diese Masterprüfungsordnung regelt Studienablauf, Prüfungen und den Abschluss des Studiums im Masterstudiengang Wirtschaftsmathematik am KIT.

§ 2 Ziel des Studiums, akademischer Grad

(1) Im konsekutiven Masterstudium sollen die im Bachelorstudium erworbenen wissenschaftlichen Qualifikationen weiter vertieft, verbreitert, erweitert oder ergänzt werden. Ziel des Studiums ist die Fähigkeit, die wissenschaftlichen Erkenntnisse und Methoden selbstständig anzuwenden und ihre Bedeutung und Reichweite für die Lösung komplexer wissenschaftlicher und gesellschaftlicher Problemstellungen zu bewerten.

(2) Aufgrund der bestandenen Masterprüfung wird der akademische Grad „Master of Science (M.Sc.)“ für den Masterstudiengang Wirtschaftsmathematik verliehen.

§ 3 Regelstudienzeit, Studienaufbau, Leistungspunkte

(1) Die Regelstudienzeit beträgt vier Semester.

(2) Das Lehrangebot des Studiengangs ist in Fächer, die Fächer sind in Module, die jeweiligen Module in Lehrveranstaltungen gegliedert. Die Fächer und ihr Umfang werden in § 19 festgelegt. Näheres beschreibt das Modulhandbuch. .

(3) Der für das Absolvieren von Lehrveranstaltungen und Modulen vorgesehene Arbeitsaufwand wird in Leistungspunkten (LP) ausgewiesen. Die Maßstäbe für die Zuordnung von Leistungspunkten entsprechen dem European Credit Transfer System (ECTS). Ein Leistungspunkt entspricht einem Arbeitsaufwand von etwa 30 Zeitstunden. Die Verteilung der Leistungspunkte auf die Semester hat in der Regel gleichmäßig zu erfolgen.

(4) Der Umfang der für den erfolgreichen Abschluss des Studiums erforderlichen Studien- und Prüfungsleistungen wird in Leistungspunkten gemessen und beträgt insgesamt 120 Leistungspunkte.

(5) Lehrveranstaltungen können nach vorheriger Ankündigung auch in englischer Sprache angeboten werden.

§ 4 Modulprüfungen, Studien- und Prüfungsleistungen

(1) Die Masterprüfung besteht aus Modulprüfungen. Modulprüfungen bestehen aus einer oder mehreren Erfolgskontrollen.

Erfolgskontrollen gliedern sich in Studien- oder Prüfungsleistungen.

(2) Prüfungsleistungen sind:

1. schriftliche Prüfungen,
2. mündliche Prüfungen oder
3. Prüfungsleistungen anderer Art.

(3) Studienleistungen sind schriftliche, mündliche oder praktische Leistungen, die von den Studierenden in der Regel lehrveranstaltungsbegleitend erbracht werden. Die Masterprüfung darf nicht mit einer Studienleistung abgeschlossen werden.

(4) Von den Modulprüfungen sollen mindestens 70 % benotet sein.

(5) Bei sich ergänzenden Inhalten können die Modulprüfungen mehrerer Module durch eine auch modulübergreifende Prüfungsleistung (Absatz 2 Nr.1 bis 3) ersetzt werden.

§ 5 Anmeldung und Zulassung zu den Modulprüfungen und Lehrveranstaltungen

(1) Um an den Modulprüfungen teilnehmen zu können, müssen sich die Studierenden online im Studierendenportal zu den jeweiligen Erfolgskontrollen anmelden. In Ausnahmefällen kann eine Anmeldung schriftlich im Studierendenservice oder in einer anderen, vom Studierendenservice autorisierten Einrichtung erfolgen. Für die Erfolgskontrollen können durch die Prüfenden Anmeldefristen festgelegt werden. Die Anmeldung der Masterarbeit ist im Modulhandbuch geregelt.

(2) Sofern Wahlmöglichkeiten bestehen, müssen Studierende, um zu einer Prüfung in einem bestimmten Modul zugelassen zu werden, vor der ersten Prüfung in diesem Modul mit der Anmeldung zu der Prüfung eine bindende Erklärung über die Wahl des betreffenden Moduls und dessen Zuordnung zu einem Fach abgeben. Auf Antrag des/der Studierenden an den Prüfungsausschuss kann die Wahl oder die Zuordnung nachträglich geändert werden.

(3) Zu einer Erfolgskontrolle ist zuzulassen, wer

1. in den Masterstudiengang Wirtschaftsmathematik am KIT eingeschrieben ist; die Zulassung beurlaubter Studierender ist auf Prüfungsleistungen beschränkt; und

2. nachweist, dass er die im Modulhandbuch für die Zulassung zu einer Erfolgskontrolle festgelegten Voraussetzungen erfüllt und

3. nachweist, dass er in dem Masterstudiengang Wirtschaftsmathematik den Prüfungsanspruch nicht verloren hat.

(4) Nach Maßgabe von § 30 Abs. 5 LHG kann die Zulassung zu einzelnen Pflichtveranstaltungen beschränkt werden. Der/die Prüfende entscheidet über die Auswahl unter den Studierenden, die sich rechtzeitig bis zu dem von dem/der Prüfenden festgesetzten Termin angemeldet haben unter Berücksichtigung des Studienfortschritts dieser Studierenden und unter Beachtung von § 13 Abs. 1 Satz 1 und 2, sofern ein Abbau des Überhangs durch andere oder zusätzliche Veranstaltungen nicht möglich ist. Für den Fall gleichen Studienfortschritts sind durch die KIT-Fakultäten weitere Kriterien festzulegen. Das Ergebnis wird den Studierenden rechtzeitig bekannt gegeben.

(5) Die Zulassung ist zu versagen, wenn die in Absatz 3 und 4 genannten Voraussetzungen nicht erfüllt sind. Die Zulassung kann versagt werden, wenn die betreffende Erfolgskontrolle bereits in einem grundständigen Bachelorstudiengang am KIT erbracht wurde, der Zulassungsvoraussetzung für diesen Masterstudiengang gewesen ist. Dies gilt nicht für Mastervorzugsleistungen. Zu diesen ist eine Zulassung nach Maßgabe von Satz 1 ausdrücklich zu genehmigen.

§ 6 Durchführung von Erfolgskontrollen

(1) Erfolgskontrollen werden studienbegleitend, in der Regel im Verlauf der Vermittlung der Lehrinhalte der einzelnen Module oder zeitnah danach, durchgeführt.

(2) Die Art der Erfolgskontrolle (§ 4 Abs. 2 Nr. 1 bis 3, Abs. 3) wird von der/dem Prüfenden der betreffenden Lehrveranstaltung in Bezug auf die Lerninhalte der Lehrveranstaltung und die Lernziele des Moduls festgelegt. Die Art der Erfolgskontrolle, ihre Häufigkeit, Reihenfolge und Gewichtung sowie gegebenenfalls die Bildung der Modulnote müssen mindestens sechs Wochen vor Vorlesungsbeginn im Modulhandbuch bekannt gemacht werden. Im Einvernehmen von Prüfendem und Studierender bzw. Studierendem können die Art der Prüfungsleistung sowie die Prüfungssprache auch nachträglich geändert werden; im ersten Fall ist jedoch § 4 Abs. 4 zu berücksichtigen. Bei der Prüfungsorganisation sind die Belange Studierender mit Behinderung oder chronischer Erkrankung gemäß § 13 Abs. 1 zu berücksichtigen. § 13 Abs. 1 Satz 3 und 4 gelten entsprechend.

(3) Bei unvertretbar hohem Prüfungsaufwand kann eine schriftlich durchzuführende Prüfungsleistung auch mündlich, oder eine mündlich durchzuführende Prüfungsleistung auch schriftlich abgenommen werden. Diese Änderung muss mindestens sechs Wochen vor der Prüfungsleistung bekannt gegeben werden.

(4) Bei Lehrveranstaltungen in englischer Sprache (§ 3 Abs. 6) können die entsprechenden Erfolgskontrollen in dieser Sprache abgenommen werden. § 6 Abs. 2 gilt entsprechend.

(5) *Schriftliche Prüfungen* (§ 4 Abs. 2 Nr. 1) sind in der Regel von einer/einem Prüfenden nach § 18 Abs. 2 oder 3 zu bewerten. Sofern eine Bewertung durch mehrere Prüfende erfolgt, ergibt sich die Note aus dem arithmetischen Mittel der Einzelbewertungen. Entspricht das arithmetische Mittel keiner der in § 7 Abs. 2 Satz 2 definierten Notenstufen, so ist auf die nächstliegende Notenstufe auf- oder abzurunden. Bei gleichem Abstand ist auf die nächstbessere Notenstufe zu runden. Das Bewertungsverfahren soll sechs Wochen nicht überschreiten. Schriftliche Prüfungen dauern mindestens 60 und höchstens 300 Minuten.

(6) *Mündliche Prüfungen* (§ 4 Abs. 2 Nr. 2) sind von mehreren Prüfenden (Kollegialprüfung) oder von einer/einem Prüfenden in Gegenwart einer oder eines Beisitzenden als Gruppen- oder Einzelprüfungen abzunehmen und zu bewerten. Vor der Festsetzung der Note hört die/der Prüfende die anderen an der Kollegialprüfung mitwirkenden Prüfenden an. Mündliche Prüfungen dauern in der Regel mindestens 15 Minuten und maximal 60 Minuten pro Studierenden.

Die wesentlichen Gegenstände und Ergebnisse der *mündlichen Prüfung* sind in einem Protokoll festzuhalten. Das Ergebnis der Prüfung ist den Studierenden im Anschluss an die mündliche Prüfung bekannt zu geben.

Studierende, die sich in einem späteren Semester der gleichen Prüfung unterziehen wollen, werden entsprechend den räumlichen Verhältnissen und nach Zustimmung des Prüflings als Zuhörerinnen und Zuhörer bei mündlichen Prüfungen zugelassen. Die Zulassung erstreckt sich nicht auf die Beratung und Bekanntgabe der Prüfungsergebnisse.

(7) Für *Prüfungsleistungen anderer Art* (§ 4 Abs. 2 Nr. 3) sind angemessene Bearbeitungsfristen einzuräumen und Abgabetermine festzulegen. Dabei ist durch die Art der Aufgabenstellung und durch entsprechende Dokumentation sicherzustellen, dass die erbrachte Prüfungsleistung dem/der Studierenden zurechenbar ist. Die wesentlichen Gegenstände und Ergebnisse der Erfolgskontrolle sind in einem Protokoll festzuhalten.

Bei *mündlich* durchgeführten *Prüfungsleistungen anderer Art* muss neben der/dem Prüfenden ein/e Beisitzende/r anwesend sein, die/der zusätzlich zum/r Prüfenden das Protokoll zeichnet.

Schriftliche Arbeiten im Rahmen einer *Prüfungsleistung anderer Art* haben dabei die folgende Erklärung zu tragen: „Ich versichere wahrheitsgemäß, die Arbeit selbstständig angefertigt, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde.“ Trägt die Arbeit diese Erklärung nicht, wird sie nicht angenommen. Die wesentlichen Gegenstände und Ergebnisse einer solchen Erfolgskontrolle sind in einem Protokoll festzuhalten.

§ 6 a Erfolgskontrollen im Antwort-Wahl-Verfahren

Das Modulhandbuch regelt, ob und in welchem Umfang Erfolgskontrollen im Wege des *Antwort-Wahl-Verfahrens* abgelegt werden können

§ 6 b Computergestützte Erfolgskontrollen

(1) Erfolgskontrollen können computergestützt durchgeführt werden. Dabei wird die Antwort bzw. Lösung der/des Studierenden elektronisch übermittelt und, sofern möglich, automatisiert ausgewertet. Die Prüfungsinhalte sind von einer/einem Prüfenden zu erstellen.

(2) Vor der computergestützten Erfolgskontrolle hat die/der Prüfende sicherzustellen, dass die elektronischen Daten eindeutig identifiziert und unverwechselbar und dauerhaft den Studierenden zugeordnet werden können. Der störungsfreie Verlauf einer computergestützten Erfolgskontrolle ist durch entsprechende technische Betreuung zu gewährleisten, insbesondere ist die Erfolgskontrolle in Anwesenheit einer fachlich sachkundigen Person durchzuführen. Alle Prüfungsaufgaben müssen während der gesamten Bearbeitungszeit zur Bearbeitung zur Verfügung stehen.

(3) Im Übrigen gelten für die Durchführung von computergestützten Erfolgskontrollen die §§ 6 bzw. 6 a.

§ 7 Bewertung von Studien- und Prüfungsleistungen

(1) Das Ergebnis einer Prüfungsleistung wird von den jeweiligen Prüfenden in Form einer Note festgesetzt.

(2) Folgende Noten sollen verwendet werden:

sehr gut (very good)	:	hervorragende Leistung,
gut (good)	:	eine Leistung, die erheblich über den durchschnittlichen Anforderungen liegt,
befriedigend (satisfactory)	:	eine Leistung, die durchschnittlichen Anforderungen entspricht,
ausreichend (sufficient)	:	eine Leistung, die trotz ihrer Mängel noch den Anforderungen genügt,
nicht ausreichend (failed)	:	eine Leistung, die wegen erheblicher Mängel nicht den Anforderungen genügt.

Zur differenzierten Bewertung einzelner Prüfungsleistungen sind nur folgende Noten zugelassen:

1,0; 1,3	:	sehr gut
1,7; 2,0; 2,3	:	gut
2,7; 3,0; 3,3	:	befriedigend
3,7; 4,0	:	ausreichend
5,0	:	nicht ausreichend

(3) Studienleistungen werden mit „bestanden“ oder mit „nicht bestanden“ gewertet.

(4) Bei der Bildung der gewichteten Durchschnitte der Modulnoten, der Fachnoten und der Gesamtnote wird nur die erste Dezimalstelle hinter dem Komma berücksichtigt; alle weiteren Stellen werden ohne Rundung gestrichen.

(5) Jedes Modul und jede Erfolgskontrolle darf in demselben Studiengang nur einmal gewertet werden.

(6) Eine Prüfungsleistung ist bestanden, wenn die Note mindestens „ausreichend“ (4,0) ist.

(7) Die Modulprüfung ist bestanden, wenn alle erforderlichen Erfolgskontrollen bestanden sind. Die Modulprüfung und die Bildung der Modulnote sollen im Modulhandbuch geregelt werden. Sofern das Modulhandbuch keine Regelung über die Bildung der Modulnote enthält, errechnet sich die Modulnote aus einem nach den Leistungspunkten der einzelnen Teilmodule gewichteten Notendurchschnitt. Die differenzierten Noten (Absatz 2) sind bei der Berechnung der Modulnoten als Ausgangsdaten zu verwenden.

(8) Die Ergebnisse der Erfolgskontrollen sowie die erworbenen Leistungspunkte werden durch den Studierendenservice des KIT verwaltet.

(9) Die Noten der Module eines Faches gehen in die Fachnote mit einem Gewicht proportional zu den ausgewiesenen Leistungspunkten der Module ein.

(10) Die Gesamtnote der Masterprüfung, die Fachnoten und die Modulnoten lauten:

		bis	1,5	=	sehr gut
von	1,6	bis	2,5	=	gut
von	2,6	bis	3,5	=	befriedigend
von	3,6	bis	4,0	=	ausreichend

§ 8 Wiederholung von Erfolgskontrollen, endgültiges Nichtbestehen

(1) Studierende können eine nicht bestandene schriftliche Prüfung (§ 4 Absatz 2 Nr. 1) einmal wiederholen. Wird eine schriftliche Wiederholungsprüfung mit „nicht ausreichend“ (5,0) bewertet, so findet eine mündliche Nachprüfung im zeitlichen Zusammenhang mit dem Termin der nicht bestandenen Prüfung statt. In diesem Falle kann die Note dieser Prüfung nicht besser als „ausreichend“ (4,0) sein.

(2) Studierende können eine nicht bestandene mündliche Prüfung (§ 4 Absatz 2 Nr. 2) einmal wiederholen.

(3) Wiederholungsprüfungen nach Absatz 1 und 2 müssen in Inhalt, Umfang und Form (mündlich oder schriftlich) der ersten entsprechen. Ausnahmen kann der zuständige Prüfungsausschuss auf Antrag zulassen.

(4) Prüfungsleistungen anderer Art (§ 4 Absatz 2 Nr. 3) können einmal wiederholt werden.

(5) Studienleistungen können mehrfach wiederholt werden.

(6) Die Prüfungsleistung ist endgültig nicht bestanden, wenn die mündliche Nachprüfung im Sinne des Absatzes 1 mit „nicht ausreichend“ (5,0) bewertet wurde. Die Prüfungsleistung ist ferner endgültig nicht bestanden, wenn die mündliche Prüfung im Sinne des Absatzes 2 oder die Prüfungsleistung anderer Art gemäß Absatz 4 zweimal mit „nicht bestanden“ bewertet wurde.

(7) Das Modul ist endgültig nicht bestanden, wenn eine für sein Bestehen erforderliche Prüfungsleistung endgültig nicht bestanden ist.

(8) Eine zweite Wiederholung derselben Prüfungsleistung gemäß § 4 Abs. 2 ist nur in Ausnahmefällen auf Antrag des/der Studierenden zulässig („Antrag auf Zweitwiederholung“). Der Antrag ist schriftlich beim Prüfungsausschuss in der Regel bis zwei Monate nach Bekanntgabe der Note zu stellen.

Über den ersten Antrag eines/einer Studierenden auf Zweitwiederholung entscheidet der Prüfungsausschuss, wenn er den Antrag genehmigt. Wenn der Prüfungsausschuss diesen Antrag ablehnt, entscheidet ein Mitglied des Präsidiums. Über weitere Anträge auf Zweitwiederholung entscheidet nach Stellungnahme des Prüfungsausschusses ein Mitglied des Präsidiums. Wird der Antrag genehmigt, hat die Zweitwiederholung spätestens zum übernächsten Prüfungstermin zu erfolgen. Absatz 1 Satz 2 und 3 gelten entsprechend.

(9) Die Wiederholung einer bestandenen Prüfungsleistung ist nicht zulässig.

(10) Die Masterarbeit kann bei einer Bewertung mit „nicht ausreichend“ (5,0) einmal wiederholt werden. Eine zweite Wiederholung der Masterarbeit ist ausgeschlossen.

§ 9 Verlust des Prüfungsanspruchs

Ist eine nach dieser Studien- und Prüfungsordnung erforderliche Studien- oder Prüfungsleistung endgültig nicht bestanden oder die Masterprüfung bis zum Ende des Prüfungszeitraums des siebten Fachsemesters einschließlich etwaiger Wiederholungen nicht vollständig abgelegt, so erlischt der Prüfungsanspruch im Masterstudiengang Wirtschaftsmathematik, es sei denn, dass die Fristüberschreitung nicht selbst zu vertreten ist. Die Entscheidung über eine Fristverlängerung und über Ausnahmen von der Fristregelung trifft der Prüfungsausschuss unter Beachtung der in § 32 Abs. 6 LHG genannten Tätigkeiten auf Antrag des/der Studierenden. Der Antrag ist schriftlich in der Regel bis sechs Wochen vor Ablauf der Frist zu stellen.

§ 10 Abmeldung; Versäumnis, Rücktritt

(1) Studierende können ihre Anmeldung zu *schriftlichen Prüfungen* ohne Angabe von Gründen bis zur Ausgabe der Prüfungsaufgaben widerrufen (Abmeldung). Eine Abmeldung kann online im Studierendenportal bis 24:00 Uhr des Vortages der Prüfung oder in begründeten Ausnahmefällen beim Studierendenservice innerhalb der Geschäftszeiten erfolgen. Erfolgt die Abmeldung gegenüber dem/der Prüfenden hat diese/r Sorge zu tragen, dass die Abmeldung im Campus Management System verbucht wird.

(2) Bei *mündlichen Prüfungen* muss die Abmeldung spätestens drei Werktage vor dem betreffenden Prüfungstermin gegenüber dem/der Prüfenden erklärt werden. Der Rücktritt von einer mündlichen Prüfung weniger als drei Werktage vor dem betreffenden Prüfungstermin ist nur unter den Voraussetzungen des Absatzes 5 möglich. Der Rücktritt von mündlichen Nachprüfungen im Sinne von § 8 Abs. 1 ist grundsätzlich nur unter den Voraussetzungen von Absatz 5 möglich.

(3) Die Abmeldung von *Prüfungsleistungen anderer Art* sowie von *Studienleistungen* ist im Modulhandbuch geregelt.

(4) Eine Erfolgskontrolle gilt als mit „nicht ausreichend“ (5,0) bewertet, wenn die Studierenden einen Prüfungstermin ohne triftigen Grund versäumen oder wenn sie nach Beginn der Erfolgskontrolle ohne triftigen Grund von dieser zurücktreten. Dasselbe gilt, wenn die Masterarbeit nicht innerhalb der vorgesehenen Bearbeitungszeit erbracht wird, es sei denn, der/die Studierende hat die Fristüberschreitung nicht zu vertreten.

(5) Der für den Rücktritt nach Beginn der Erfolgskontrolle oder das Versäumnis geltend gemachte Grund muss dem Prüfungsausschuss unverzüglich schriftlich angezeigt und glaubhaft gemacht werden. Bei Krankheit des/der Studierenden oder eines allein zu versorgenden Kindes oder pflegebedürftigen Angehörigen kann die Vorlage eines ärztlichen Attestes verlangt werden.

§ 11 Täuschung, Ordnungsverstoß

(1) Versuchen Studierende das Ergebnis ihrer Erfolgskontrolle durch Täuschung oder Benutzung nicht zugelassener Hilfsmittel zu beeinflussen, gilt die betreffende Erfolgskontrolle als mit „nicht ausreichend“ (5,0) bewertet.

(2) Studierende, die den ordnungsgemäßen Ablauf einer Erfolgskontrolle stören, können von der/dem Prüfenden oder der Aufsicht führenden Person von der Fortsetzung der Erfolgskontrolle ausgeschlossen werden. In diesem Fall gilt die betreffende Erfolgskontrolle als mit „nicht ausreichend“ (5,0) bewertet. In schwerwiegenden Fällen kann der Prüfungsausschuss diese Studierenden von der Erbringung weiterer Erfolgskontrollen ausschließen.

(3) Näheres regelt die Allgemeine Satzung des KIT zur Redlichkeit bei Prüfungen und Praktika in der jeweils gültigen Fassung.

§ 12 Mutterschutz, Elternzeit, Wahrnehmung von Familienpflichten

(1) Auf Antrag sind die Mutterschutzfristen, wie sie im jeweils gültigen Gesetz zum Schutz der erwerbstätigen Mutter (Mutterschutzgesetz - MuSchG) festgelegt sind, entsprechend zu berücksichtigen. Dem Antrag sind die erforderlichen Nachweise beizufügen. Die Mutterschutzfristen unterbrechen jede Frist nach dieser Prüfungsordnung. Die Dauer des Mutterschutzes wird nicht in die Frist eingerechnet.

(2) Gleichfalls sind die Fristen der Elternzeit nach Maßgabe des jeweils gültigen Gesetzes (Bundeselterngeld- und Elternzeitgesetz - BEEG) auf Antrag zu berücksichtigen. Der/die Studierende muss bis spätestens vier Wochen vor dem Zeitpunkt, von dem an die Elternzeit angetreten werden soll, dem Prüfungsausschuss, unter Beifügung der erforderlichen Nachweise schriftlich mitteilen, in welchem Zeitraum die Elternzeit in Anspruch genommen werden soll. Der Prüfungsausschuss hat zu prüfen, ob die gesetzlichen Voraussetzungen vorliegen, die bei einer Arbeitnehmerin bzw. einem Arbeitnehmer den Anspruch auf Elternzeit auslösen würden, und teilt dem/der Studierenden das Ergebnis sowie die neu festgesetzten Prüfungszeiten unverzüglich mit. Die Bearbeitungszeit der Masterarbeit kann nicht durch Elternzeit unterbrochen werden. Die gestellte Arbeit gilt als nicht vergeben. Nach Ablauf der Elternzeit erhält der/die Studierende ein neues Thema, das innerhalb der in § 14 festgelegten Bearbeitungszeit zu bearbeiten ist.

(3) Der Prüfungsausschuss entscheidet auf Antrag über die flexible Handhabung von Prüfungsfristen entsprechend den Bestimmungen des Landeshochschulgesetzes, wenn Studierende Familienpflichten wahrzunehmen haben. Absatz 2 Satz 4 bis 6 gelten entsprechend.

§ 13 Studierende mit Behinderung oder chronischer Erkrankung

(1) Bei der Gestaltung und Organisation des Studiums sowie der Prüfungen sind die Belange von Studierenden mit Behinderung oder chronischer Erkrankung zu berücksichtigen. Insbesondere ist Studierenden mit Behinderung oder chronischer Erkrankung bevorzugter Zugang zu teilnahmebegrenzten Lehrveranstaltungen zu gewähren und die Reihenfolge für das Absolvieren bestimmter Lehrveranstaltungen entsprechend ihrer Bedürfnisse anzupassen. Studierende sind gemäß Bundesgleichstellungsgesetz (BGG) und Sozialgesetzbuch Neuntes Buch (SGB IX) behindert, wenn ihre körperliche Funktion, geistige Fähigkeit oder seelische Gesundheit mit hoher Wahrscheinlichkeit länger als sechs Monate von dem für das Lebensalter typischen Zustand abweichen und daher ihre Teilhabe am Leben in der Gesellschaft beeinträchtigt ist. Der Prüfungsausschuss entscheidet auf Antrag der/des Studierenden über das Vorliegen der Voraussetzungen nach Satz 2 und 3. Die/der Studierende hat die entsprechenden Nachweise vorzulegen.

(2) Weisen Studierende eine Behinderung oder chronische Erkrankung nach und folgt daraus, dass sie nicht in der Lage sind, Erfolgskontrollen ganz oder teilweise in der vorgeschriebenen Zeit oder Form abzulegen, kann der Prüfungsausschuss gestatten, die Erfolgskontrollen in einem anderen Zeitraum oder einer anderen Form zu erbringen. Insbesondere ist behinderten Studierenden zu gestatten, notwendige Hilfsmittel zu benutzen.

(3) Weisen Studierende eine Behinderung oder chronische Erkrankung nach und folgt daraus, dass sie nicht in der Lage sind, die Lehrveranstaltungen regelmäßig zu besuchen oder die gemäß § 19 erforderlichen Studien- und Prüfungsleistungen zu erbringen, kann der Prüfungsausschuss auf Antrag gestatten, dass einzelne Studien- und Prüfungsleistungen nach Ablauf der in dieser Studien- und Prüfungsordnung vorgesehenen Fristen absolviert werden können.

§ 14 Modul Masterarbeit

(1) Voraussetzung für die Zulassung zum Modul Masterarbeit ist, dass die/der Studierende Modulprüfungen im Umfang von 70 LP erfolgreich abgelegt hat. Über Ausnahmen entscheidet der Prüfungsausschuss auf Antrag der/des Studierenden.

(2) Die Masterarbeit kann von Hochschullehrer/innen, leitenden Wissenschaftler/innen gemäß § 14 Abs. 3 Ziff. 1 KITG oder einem habilitierten Mitglied vergeben werden. Darüber hinaus kann der Prüfungsausschuss weitere Prüfende gemäß § 17 Abs. 2 und 3 zur Vergabe des Themas berechtigen. Den Studierenden ist Gelegenheit zu geben, für das Thema Vorschläge zu machen. Soll die Masterarbeit außerhalb der KIT-Fakultät für Mathematik oder der KIT-Fakultät für Wirtschaftswissenschaften angefertigt werden, so bedarf dies der Genehmigung durch den Prüfungsausschuss. Die Masterarbeit kann auch in Form einer Gruppenarbeit zugelassen werden, wenn der als Prüfungsleistung zu bewertende Beitrag der einzelnen Studierenden aufgrund objektiver Kriterien, die eine eindeutige Abgrenzung ermöglichen, deutlich unterscheidbar ist und die Anforderung nach Absatz 4 erfüllt. In Ausnahmefällen sorgt die/der Vorsitzende des Prüfungsausschusses auf Antrag der oder des Studierenden dafür, dass die/der Studierende innerhalb von vier Wochen ein Thema für die Masterarbeit erhält. Die Ausgabe des Themas erfolgt in diesem Fall über die/den Vorsitzende/n des Prüfungsausschusses.

(3) Thema, Aufgabenstellung und Umfang der Masterarbeit sind von dem Betreuer bzw. der Betreuerin so zu begrenzen, dass sie mit dem in Absatz 4 festgelegten Arbeitsaufwand bearbeitet werden kann.

(4) Die Masterarbeit soll zeigen, dass die Studierenden in der Lage sind, ein Problem aus ihrem Studienfach selbstständig und in begrenzter Zeit nach wissenschaftlichen Methoden zu bearbeiten. Der Umfang der Masterarbeit entspricht 30 Leistungspunkten. Die maximale Bearbeitungsdauer beträgt sechs Monate. Thema und Aufgabenstellung sind an den vorgesehenen Umfang anzupassen. Der Prüfungsausschuss legt fest, in welchen Sprachen die Masterarbeit geschrieben werden kann. Auf Antrag des Studierenden kann der/die Prüfende genehmigen, dass die Masterarbeit in einer anderen Sprache als Deutsch geschrieben wird.

(5) Bei der Abgabe der Masterarbeit haben die Studierenden schriftlich zu versichern, dass sie die Arbeit selbstständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt haben, die wörtlich oder inhaltlich übernommenen Stellen als solche kenntlich gemacht und die Satzung des KIT zur Sicherung guter wissenschaftlicher Praxis in der jeweils gültigen Fassung beachtet haben. Wenn diese Erklärung nicht enthalten ist, wird die Arbeit nicht angenommen. Die Erklärung kann wie folgt lauten: „Ich versichere wahrheitsgemäß, die Arbeit selbstständig verfasst, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde sowie die Satzung des KIT zur Sicherung guter wissenschaftlicher Praxis in der jeweils gültigen Fassung beachtet zu haben.“ Bei Abgabe einer unwahren Versicherung wird die Masterarbeit mit „nicht ausreichend“ (5,0) bewertet.

(6) Der Zeitpunkt der Ausgabe des Themas der Masterarbeit ist durch die Betreuerin/den Betreuer und die/den Studierenden festzuhalten und dies beim Prüfungsausschuss aktenkundig zu machen. Der Zeitpunkt der Abgabe der Masterarbeit ist durch den/die Prüfende/n beim Prüfungsausschuss aktenkundig zu machen. Das Thema kann nur einmal und nur innerhalb des ersten Monats der Bearbeitungszeit zurückgegeben werden. Macht der oder die Studierende einen triftigen Grund geltend, kann der Prüfungsausschuss die in Absatz 4 festgelegte Bearbeitungszeit auf Antrag der oder des Studierenden um höchstens drei Monate verlängern. Wird die Masterarbeit nicht fristgerecht abgeliefert, gilt sie als mit „nicht ausreichend“ (5,0) bewertet, es sei denn, dass die Studierenden dieses Versäumnis nicht zu vertreten haben.

(7) Die Masterarbeit wird von mindestens einem/einer Hochschullehrer/in, einem habilitierten Mitglied oder einem/einer leitenden Wissenschaftler/in gemäß § 14 abs. 3 Ziff. 1 KITG und einem/einer weiteren Prüfenden bewertet. In der Regel ist eine/r der Prüfenden die Person, die die Arbeit gemäß Absatz 2 vergeben hat. Bei nicht übereinstimmender Beurteilung dieser beiden Personen setzt der Prüfungsausschuss im Rahmen der Bewertung dieser beiden Personen die Note der Masterarbeit fest; er kann auch einen weiteren Gutachter bestellen. Die Bewertung hat innerhalb von acht Wochen nach Abgabe der Masterarbeit zu erfolgen.

§ 15 Zusatzleistungen

(1) Es können auch weitere Leistungspunkte (Zusatzleistungen) im Umfang von höchstens 30 LP aus dem Gesamtangebot des KIT erworben werden. § 3 und § 4 der Prüfungsordnung bleiben davon unberührt. Diese Zusatzleistungen gehen nicht in die Festsetzung der Gesamt- und Modulnoten ein. Die bei der Festlegung der Modulnote nicht berücksichtigten LP werden als Zusatzleistungen im Transcript of Records aufgeführt und als Zusatzleistungen gekennzeichnet. Auf Antrag der/des Studierenden werden die Zusatzleistungen in das Masterzeugnis aufgenommen und als Zusatzleistungen gekennzeichnet. Zusatzleistungen werden mit den nach § 7 vorgesehenen Noten gelistet.

(2) Die Studierenden haben bereits bei der Anmeldung zu einer Prüfung in einem Modul diese als Zusatzleistung zu deklarieren.

§ 16 Prüfungsausschuss

(1) Für den Masterstudiengang Wirtschaftsmathematik wird ein Prüfungsausschuss gebildet. Er besteht aus sechs stimmberechtigten Mitgliedern, die jeweils zur Hälfte von der Fakultät für Mathematik und der Fakultät für Wirtschaftswissenschaften bestellt werden: vier Hochschullehrer/innen / leitenden Wissenschaftler/innen gemäß § 14 Abs. 3 Ziff. 1 KITG / Privatdozentinnen bzw. -dozenten, zwei akademischen Mitarbeiterinnen und Mitarbeitern nach § 52 LHG / wissenschaftlichen Mitarbeiter/innen gemäß § 14 Abs. 3 Ziff. 2 KITG und einer bzw. einem Studierenden mit beratender Stimme. Die Amtszeit der nichtstudentischen Mitglieder beträgt zwei Jahre, die des studentischen Mitglieds ein Jahr.

(2) Die/der Vorsitzende, ihre/sein Stellvertreter/in, die weiteren Mitglieder des Prüfungsausschusses sowie deren Stellvertreter/innen werden von dem KIT-Fakultätsrat bestellt, die akademischen Mitarbeiter/innen nach § 52 LHG, die wissenschaftlichen Mitarbeiter gemäß § 14 Abs. 3 Ziff. 2 KITG und die Studierenden auf Vorschlag der Mitglieder der jeweiligen Gruppe; Wiederbestellung ist möglich. Die/der Vorsitzende und deren/dessen Stellvertreter/in müssen Hochschullehrer/innen oder leitende Wissenschaftler/innen § 14 Abs. 3 Ziff. 1 KITG sein. Die/der Vorsitzende des Prüfungsausschusses nimmt die laufenden Geschäfte wahr und wird durch das jeweilige Prüfungssekretariat unterstützt.

(3) Der Prüfungsausschuss achtet auf die Einhaltung der Bestimmungen dieser Studien- und Prüfungsordnung und fällt die Entscheidungen in Prüfungsangelegenheiten. Er entscheidet über die Anerkennung von Studienzeiten sowie Studien- und Prüfungsleistungen und trifft die Feststellung gemäß § 18 Absatz 1 Satz 1. Er berichtet der KIT-Fakultät regelmäßig über die Entwicklung der Prüfungs- und Studienzeiten, einschließlich der Bearbeitungszeiten für die Masterarbeiten und die Verteilung der Modul- und Gesamtnoten. Er ist zuständig für Anregungen zur Reform der Studien- und Prüfungsordnung und zu Modulbeschreibungen. Der Prüfungsausschuss entscheidet mit der Mehrheit seiner Stimmen. Bei Stimmengleichheit entscheidet der Vorsitzende des Prüfungsausschusses.

(4) Der Prüfungsausschuss kann die Erledigung seiner Aufgaben für alle Regelfälle auf die/den Vorsitzende/n des Prüfungsausschusses übertragen. In dringenden Angelegenheiten, deren Erledigung nicht bis zu der nächsten Sitzung des Prüfungsausschusses warten kann, entscheidet die/der Vorsitzende des Prüfungsausschusses.

(5) Die Mitglieder des Prüfungsausschusses haben das Recht, der Abnahme von Prüfungen beizuwohnen. Die Mitglieder des Prüfungsausschusses, die Prüfenden und die Beisitzenden unterliegen der Verschwiegenheit. Sofern sie nicht im öffentlichen Dienst stehen, sind sie durch die/den Vorsitzende/n zur Verschwiegenheit zu verpflichten.

(6) In Angelegenheiten des Prüfungsausschusses, die eine an einer anderen KIT-Fakultät zu absolvierende Prüfungsleistung betreffen, ist auf Antrag eines Mitgliedes des Prüfungsausschusses eine fachlich zuständige und von der betroffenen KIT-Fakultät zu nennende prüfungsberechtigte Person hinzuzuziehen.

(7) Belastende Entscheidungen des Prüfungsausschusses sind schriftlich mitzuteilen. Sie sind zu begründen und mit einer Rechtsbehelfsbelehrung zu versehen. Vor einer Entscheidung ist Gelegenheit zur Äußerung zu geben. Widersprüche gegen Entscheidungen des Prüfungsausschusses sind innerhalb eines Monats nach Zugang der Entscheidung schriftlich oder zur Niederschrift beim Präsidium des KIT einzulegen.

§ 17 Prüfende und Beisitzende

(1) Der Prüfungsausschuss bestellt die Prüfenden. Er kann die Bestellung der/dem Vorsitzenden übertragen.

(2) Prüfende sind Hochschullehrer/innen sowie leitende Wissenschaftler/innen gemäß § 14 Abs. 3 Ziff. 1 KITG, habilitierte Mitglieder und akademische Mitarbeiter/innen gemäß § 52 LHG, welche der KIT-Fakultät für Mathematik oder der KIT-Fakultät für Wirtschaftswissenschaften angehören und denen die Prüfungsbefugnis übertragen wurde; desgleichen kann wissenschaftlichen Mitarbeitern gemäß § 14 Abs. 3 Ziff. 2 KITG die Prüfungsbefugnis übertragen werden. Bestellt werden darf nur, wer mindestens die dem jeweiligen Prüfungsgegenstand entsprechende fachwissenschaftliche Qualifikation erworben hat.

(3) Soweit Lehrveranstaltungen von anderen als den unter Absatz 2 genannten Personen durchgeführt werden, sollen diese zu Prüfenden bestellt werden, sofern die KIT-Fakultät für Mathematik oder die KIT-Fakultät für Wirtschaftswissenschaften eine Prüfungsbefugnis erteilt hat und sie die gemäß Absatz 2 Satz 2 vorausgesetzte Qualifikation nachweisen können.

(4) Die Beisitzenden werden durch die Prüfenden benannt. Zu Beisitzenden darf nur bestellt werden, wer einen akademischen Abschluss in einem Masterstudiengang der Wirtschaftsmathematik oder einen gleichwertigen akademischen Abschluss erworben hat.

§ 18 Anerkennung von Studien- und Prüfungsleistungen, Studienzeiten

(1) Studien- und Prüfungsleistungen sowie Studienzeiten, die in Studiengängen an staatlichen oder staatlich anerkannten Hochschulen und Berufsakademien der Bundesrepublik Deutschland oder an ausländischen staatlichen oder staatlich anerkannten Hochschulen erbracht wurden, werden auf Antrag der Studierenden anerkannt, sofern hinsichtlich der erworbenen Kompetenzen kein wesentlicher Unterschied zu den Leistungen oder Abschlüssen besteht, die ersetzt werden sollen. Dabei ist kein schematischer Vergleich, sondern eine Gesamtbetrachtung vorzunehmen. Bezüglich des Umfangs einer zur Anerkennung vorgelegten Studienleistung (Anrechnung) werden die Grundsätze des ECTS herangezogen.

(2) Die Studierenden haben die für die Anerkennung erforderlichen Unterlagen vorzulegen. Studierende, die neu in den Masterstudiengang Wirtschaftsmathematik immatrikuliert wurden, haben den Antrag mit den für die Anerkennung erforderlichen Unterlagen innerhalb eines Semesters nach Immatrikulation zu stellen. Bei Unterlagen, die nicht in deutscher oder englischer Sprache vorliegen, kann eine amtlich beglaubigte Übersetzung verlangt werden. Die Beweislast dafür, dass der Antrag die Voraussetzungen für die Anerkennung nicht erfüllt, liegt beim Prüfungsausschuss.

(3) Werden Leistungen angerechnet, die nicht am KIT erbracht wurden, werden sie im Zeugnis als „anerkannt" ausgewiesen. Liegen Noten vor, werden die Noten, soweit die Notensysteme vergleichbar sind, übernommen und in die Berechnung der Modulnoten und der Gesamtnote einbezogen. Sind die Notensysteme nicht vergleichbar, können die Noten umgerechnet werden. Liegen keine Noten vor, wird der Vermerk „bestanden" aufgenommen.

(4) Bei der Anerkennung von Studien- und Prüfungsleistungen, die außerhalb der Bundesrepublik Deutschland erbracht wurden, sind die von der Kultusministerkonferenz und der Hochschulrektorenkonferenz gebilligten Äquivalenzvereinbarungen sowie Absprachen im Rahmen der Hochschulpartnerschaften zu beachten.

(5) Außerhalb des Hochschulsystems erworbene Kenntnisse und Fähigkeiten werden angerechnet, wenn sie nach Inhalt und Niveau den Studien- und Prüfungsleistungen gleichwertig sind, die ersetzt werden sollen und die Institution, in der die Kenntnisse und Fähigkeiten erworben wurden, ein genormtes Qualitätssicherungssystem hat. Die Anrechnung kann in Teilen versagt werden, wenn mehr als 50 Prozent des Hochschulstudiums ersetzt werden soll.

(6) Zuständig für Anerkennung und Anrechnung ist der Prüfungsausschuss. Im Rahmen der Feststellung, ob ein wesentlicher Unterschied im Sinne des Absatz 1 vorliegt, sind die zuständigen Fachvertreter/innen zu hören. Der Prüfungsausschuss entscheidet in Abhängigkeit von Art und Umfang der anzurechnenden Studien- und Prüfungsleistungen über die Einstufung in ein höheres Fachsemester.

II. Masterprüfung

§ 19 Umfang und Art der Masterprüfung

(1) Die Masterprüfung besteht aus den Modulprüfungen nach Absatz 2 und 3 sowie dem Modul Masterarbeit (§ 14).

(2) Es sind Modulprüfungen in folgenden Pflichtfächern abzulegen:

1. Fach: "Mathematische Methoden": Modul(e) im Umfang von 36 LP, wovon mindestens 8 LP aus Modulen der Stochastik und weitere 8 LP aus Modulen der Analysis oder Angewandter und Numerischer Mathematik, Optimierung stammen müssen.
2. Fach: "Finance - Risk Management - Managerial Economics": Modul(e) im Umfang von 18 LP.
3. Fach: "Operations Management - Datenanalyse - Informatik": Modul(e) im Umfang von 18 LP.
4. Fach: „Wirtschaftswissenschaftliches Seminar“: Modul(e) im Umfang von 3 LP.
5. Fach: „Mathematisches Seminar“: Modul(e) im Umfang von 3 LP.

Die Festlegung der zur Auswahl stehenden Module und deren Fachzuordnung werden im Modulhandbuch getroffen.

(3) Im Wahlpflichtfach sind Modulprüfungen im Umfang von 12 LP abzulegen. Die Festlegung der zur Auswahl stehenden Module wird im Modulhandbuch getroffen.

§ 20 Bestehen der Masterprüfung, Bildung der Gesamtnote

(1) Die Masterprüfung ist bestanden, wenn alle in § 19 genannten Modulprüfungen mindestens mit „ausreichend“ bewertet wurden.

(2) Die Gesamtnote der Masterprüfung errechnet sich als ein mit Leistungspunkten gewichteter Notendurchschnitt der Fachnoten der Fächer 1 – 4 gemäß § 19 Abs. 2, dem Wahlpflichtfach gemäß § 19 Abs. 3 und dem Modul Masterarbeit.

(3) Haben Studierende die Masterarbeit mit der Note 1,0 und die Masterprüfung mit einem Durchschnitt von 1,2 oder besser abgeschlossen, so wird das Prädikat „mit Auszeichnung“ (with distinction) verliehen.

§ 21 Masterzeugnis, Masterurkunde, Diploma Supplement und Transcript of Records

(1) Über die Masterprüfung werden nach Bewertung der letzten Prüfungsleistung eine Masterurkunde und ein Zeugnis erstellt. Die Ausfertigung von Masterurkunde und Zeugnis soll nicht später als drei Monate nach Ablegen der letzten Prüfungsleistung erfolgen. Masterurkunde und Masterzeugnis werden in deutscher und englischer Sprache ausgestellt. Masterurkunde und Zeugnis tragen das Datum der erfolgreichen Erbringung der letzten Prüfungsleistung. Diese Dokumente werden den Studierenden zusammen ausgehändigt. In der Masterurkunde wird die

Verleihung des akademischen Mastergrades beurkundet. Die Masterurkunde wird von dem Präsidenten und den KIT-Dekaninnen/ den KIT-Dekanen der KIT-Fakultät für Mathematik und der KIT-Fakultät für Wirtschaftswissenschaften unterzeichnet und mit dem Siegel des KIT versehen.

(2) Das Zeugnis enthält die Fach- und Modulnoten sowie die den Modulen und Fächern zugeordnete Leistungspunkte und die Gesamtnote. Sofern gemäß § 7 Abs. 2 Satz 2 eine differenzierte Bewertung einzelner Prüfungsleitungen vorgenommen wurde, wird auf dem Zeugnis auch die entsprechende Dezimalnote ausgewiesen; § 7 Abs. 4 bleibt unberührt. Das Zeugnis ist von den KIT-Dekaninnen/ den KIT-Dekanen der KIT-Fakultät für Mathematik und der KIT-Fakultät für Wirtschaftswissenschaften und von der/dem Vorsitzenden des Prüfungsausschusses zu unterzeichnen.

(3) Mit dem Zeugnis erhalten die Studierenden ein Diploma Supplement in deutscher und englischer Sprache, das den Vorgaben des jeweils gültigen ECTS Users‘ Guide entspricht, sowie ein Transcript of Records in deutscher und englischer Sprache.

(4) Das Transcript of Records enthält in strukturierter Form alle erbrachten Studien- und Prüfungsleistungen. Dies beinhaltet alle Fächer und Fachnoten samt den zugeordneten Leistungspunkten, die dem jeweiligen Fach zugeordneten Module mit den Modulnoten und zugeordneten Leistungspunkten sowie die den Modulen zugeordneten Erfolgskontrollen samt Noten und zugeordneten Leistungspunkten. Absatz 2 Satz 2 gilt entsprechend. Aus dem Transcript of Records soll die Zugehörigkeit von Lehrveranstaltungen zu den einzelnen Modulen deutlich erkennbar sein. Angerechnete Studien- und Prüfungsleistungen sind im Transcript of Records aufzunehmen. Alle Zusatzleistungen werden im Transcript of Records aufgeführt.

(5) Die Masterurkunde, das Masterzeugnis und das Diploma Supplement einschließlich des Transcript of Records werden vom Studierendenservice des KIT ausgestellt.

III. Schlussbestimmungen

§ 22 Bescheinigung von Prüfungsleistungen

Haben Studierende die Masterprüfung endgültig nicht bestanden, wird ihnen auf Antrag und gegen Vorlage der Exmatrikulationsbescheinigung eine schriftliche Bescheinigung ausgestellt, die die erbrachten Studien- und Prüfungsleistungen und deren Noten enthält und erkennen lässt, dass die Prüfung insgesamt nicht bestanden ist. Dasselbe gilt, wenn der Prüfungsanspruch erloschen ist.

§ 23 Aberkennung des Mastergrades

(1) Haben Studierende bei einer Prüfungsleistung getäuscht und wird diese Tatsache nach der Aushändigung des Zeugnisses bekannt, so können die Noten der Modulprüfungen, bei denen getäuscht wurde, berichtigt werden. Gegebenenfalls kann die Modulprüfung für „nicht ausreichend“ (5,0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(2) Waren die Voraussetzungen für die Zulassung zu einer Prüfung nicht erfüllt, ohne dass die/der Studierende darüber täuschen wollte, und wird diese Tatsache erst nach Aushändigung des Zeugnisses bekannt, wird dieser Mangel durch das Bestehen der Prüfung geheilt. Hat die/der Studierende die Zulassung vorsätzlich zu Unrecht erwirkt, so kann die Modulprüfung für „nicht ausreichend“ (5,0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(3) Vor einer Entscheidung des Prüfungsausschusses ist Gelegenheit zur Äußerung zu geben.

(4) Das unrichtige Zeugnis ist zu entziehen und gegebenenfalls ein neues zu erteilen. Mit dem unrichtigen Zeugnis ist auch die Masterurkunde einzuziehen, wenn die Masterprüfung aufgrund einer Täuschung für „nicht bestanden“ erklärt wurde.

(5) Eine Entscheidung nach Absatz 1 und Absatz 2 Satz 2 ist nach einer Frist von fünf Jahren ab dem Datum des Zeugnisses ausgeschlossen.

(6) Die Aberkennung des akademischen Grades richtet sich nach § 36 Abs. 7 LHG.

§ 24 Einsicht in die Prüfungsakten

(1) Nach Abschluss der Masterprüfung wird den Studierenden auf Antrag innerhalb eines Jahres Einsicht in das Prüfungsexemplar ihrer Masterarbeit, die darauf bezogenen Gutachten und in die Prüfungsprotokolle gewährt.

(2) Für die Einsichtnahme in die schriftlichen Modulprüfungen, schriftlichen Modulteilprüfungen bzw. Prüfungsprotokolle gilt eine Frist von einem Monat nach Bekanntgabe des Prüfungsergebnisses.

(3) Der/die Prüfende bestimmt Ort und Zeit der Einsichtnahme.

(4) Prüfungsunterlagen sind mindestens fünf Jahre aufzubewahren.

§ 25 Inkrafttreten, Übergangsvorschriften

(1) Diese Studien- und Prüfungsordnung tritt am 01. April 2016 in Kraft und gilt
1. für Studierende, die ihr Studium im Masterstudiengang Wirtschaftsmathematik am KIT im ersten Fachsemester aufnehmen, sowie
2. für Studierende, die ihr Studium im Masterstudiengang Wirtschaftsmathematik am KIT in einem höheren Fachsemester aufnehmen, sofern dieses Fachsemester nicht über dem Fachsemester liegt, das der erste Jahrgang nach Ziff. 1 erreicht.

(2) Die Studien- und Prüfungsordnung des KIT für den Masterstudiengang Wirtschaftsmathematik vom 28. August 2009 (Amtliche Bekanntmachung des KIT Nr. 76 vom 28. August 2009), zuletzt geändert durch Satzung vom 27. März 2014 (Amtliche Bekanntmachung des KIT Nr. 19 vom 28. März 2014), behält Gültigkeit für
1. Studierende, die ihr Studium im Masterstudiengang Wirtschaftsmathematik am KIT zuletzt im Wintersemester 2015/16 aufgenommen haben, sowie
2. für Studierende, die ihr Studium im Masterstudiengang Wirtschaftsmathematik am KIT ab dem Sommersemester 2016 in einem höheren Fachsemester aufnehmen, sofern das Fachsemester über dem liegt, das der erste Jahrgang nach Absatz 1 Ziff. 1 erreicht hat. Im Übrigen tritt sie außer Kraft.

(3) Studierende, die auf Grundlage der Studien- und Prüfungsordnung für den Masterstudiengang Wirtschaftsmathematik vom 28. August 2009 (Amtliche Bekanntmachung des KIT Nr. 76 vom 28. August 2009), zuletzt geändert durch Satzung vom 27. März 2014 (Amtliche Bekanntmachung des KIT Nr. 19 vom 28. März 2014) ihr Studium am KIT aufgenommen haben, können Prüfungen auf Grundlage dieser Studien- und Prüfungsordnung letztmalig bis zum Ende des Prüfungszeitraum des Sommersemesters 2020 ablegen.

(4) Studierende, die auf Grundlage der Studien- und Prüfungsordnung für den Diplomstudiengang Wirtschaftsmathematik vom 15. November 2001 (Amtliche Bekanntmachung des KIT Nr. 30 vom 26. November 2001), zuletzt geändert durch Satzung vom 10. September 2003 (Amtliche Bekanntmachung des KIT Nr. 28 vom 20. Oktober 2003) ihr Studium am KIT aufgenommen haben, können Prüfungen auf Grundlage dieser Studien- und Prüfungsordnung letztmalig bis zum Ende des Prüfungszeitraums des Sommersemesters 2020 ablegen.

Karlsruhe, den 17. Dezember 2015

Professor Dr.-Ing. Holger Hanselka
(Präsident)

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