Module im Bereich: Data Processing for Data Science

- Advanced Database Models
- Advanced Topics in Databases
- Advanced Topics in Deep Learning (Master)
- Advanced Topics in Networking
- Computational Geometry
- Introduction to Data Warehousing
- Datenbanken 2
- Distributed Data Management
- In-Memory and Cloud-Technologies
- Seminar 'Advanced Topics of KMD'
- VLBA – Cloud DevOps Technologies
- Wissenschaftliches Individualprojekt

Advanced Database Models

Summer

(in German: Advanced Database Models)

Module-ID: FIN-INF-103805

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
ADBM	6	Summer	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	false
Responsibility:	Gunter Saake
Lecturer:	Eike Schallehn
Classes:	• Lecture *Advanced Database Models* • Exercise *Advanced Database Models*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. DKE: Data Processing for Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. VC: Computer Science

Intended learning outcomes:
The students ...

- understand different non-relational database models, their basic concepts, and their historical development
- understand implications of non-relational data models for query processing and application development
- use non-relational DBMS and their specific capabilities
- develop databases and according applications using non-relational databases

Content:

- Overview and history of database models
- NF2-, object-oriented, object-relational, and semi-structured database models
- Application of the database models and design methodologies (extended ERM, UML, ODMG, XML Schema, etc.)
- Foundations of query languages (OQL, SQL:2003, XPath/XQuery, etc.) and query processing for non-relational data models

Workload:
56 h contact hours + 124 h self-study

Pre-examination requirements:	**Type of examination:**	**Teaching method / lecture hours per week (SWS):**
To be eligible to take the exam, you must have completed certain prerequisites. Further details will be announced in the first lecture.	Written exam (120 min)	• Lecture 2 SWS • Exercise 2 SWS

Prerequisites according to examination regulations:	**Recommended prerequisites:**
none	Database introduction course

Media:	**Literature:**

Comments:

Advanced Topics in Databases

Summer

(in German: Advanced Topics in Databases)

Module-ID: FIN-INF-120277

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
ATDB	6	Summer	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	
Responsibility:	Gunter Saake
Lecturer:	David Broneske
Classes:	• Lecture *Advanced Topics in Databases* • Exercise *Advanced Topics in Databases*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. DKE: Data Processing for Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. DE: Fachliche Spezialisierung - M.Sc. VC: Computer Science

Intended learning outcomes:
The students ...

- understand selected advanced topics in databases
- know state-of-the-art solutions for current problems in database research

- assess advanced solutions for current database systems
- can apply advanced methods in database implementation techniques

Content:
Topics of the lecture will frequently change in accordance with current research directions in the database community and represent cutting-edge aspects. Current Topics:

- Main-memory database algorithms and techniques
- Heterogeneous processing in database systems
- Advanced indexing ans storage techniques
- Storage techniques for NoSQL database systems

Workload:
56h contact hours + 124h self-study

Pre-examination requirements:	**Type of examination:**	**Teaching method / lecture hours per week (SWS):**
Successful participation in the exercise	Oral exam	• 2 SWS Lecture • 2 SWS Exercise class

Prerequisites according to examination regulations:	**Recommended prerequisites:**
none	• Knowledge about database foundations and about principles of internal database operations • Basic programming skills

Media:	**Literature:**

Comments:

Advanced Topics in Deep Learning (Master)

every

(in German: Advanced Topics in Deep Learning (Master))

Module-ID: FIN-INF-120496

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
ATDL	6	every	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	
Responsibility:	Sebastian Stober
Lecturer:	Sebastian Stober
Classes:	*Advanced Topics in Deep Learning*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. DKE: Learning Methods and Models for Data Science - M.Sc. DKE: Data Processing for Data Science - M.Sc. DKE: Applied Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. VC: Computer Science

Intended learning outcomes:
Students ...

- can read and analyze current research papers
- apply deep learning to an application domain
- gain in-depth knowledge In the application domain

- learn to work efficiently in a team on scientific problems
- learn to work on a server infrastructure
- present scientific results in a written and oral form

Content:

- Current topics from deep learning research
- Create domain-specific deep learning pipelines
- The application domain will be announced beforehand

Workload:

- 30h in person
- 150h self-study

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
	• Hausarbeit • Mündliche Prüfung	Vorlesung/Seminar (2 SWS)

Prerequisites according to examination regulations:	Recommended prerequisites:
none	Introduction to Deep Learning

Media:	Literature:

Comments:

Advanced Topics in Networking

Winter

(in German: Advanced Topics in Networking)

Module-ID: FIN-INF-120518

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
ATN	6	Winter	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	false
Responsibility:	David Hausheer
Lecturer:	David Hausheer
Classes:	• Lecture *Advanced Topics in Networking* • Exercise *Advanced Topics in Networking*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. DKE: Data Processing for Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. DE: Fachliche Spezialisierung - M.Sc. VC: Computer Science

Intended learning outcomes:
Students...

- enhance their competence in the area of networking
- understand advanced networking concepts

- can explain these concepts to other participants
- are able to apply these concepts in theoretical use cases and practical exercises
- gain expertise in practical network applications

Content:
The course deals with advanced topics in the area of networking:

- Overlay networks for content delivery, e.g., P2P, BitTorrent, CDNs, caching, overlay video streaming
- Distributed Hash Tables (DHT), e.g., Kademlia
- Blockchains
- Crypto currencies and Bitcoin
- Ethereum and smart contracts
- Secure network architectures, e.g., SCION
- Congestion Control, e.g., QUIC and Multipath-QUIC

Workload:

- 28h lectures
- 22h theoretical exercises
- 6h practical exercises
- 124h homework (further studies, practical work, preparation for the final exam)

Pre-examination requirements:	**Type of examination:**	**Teaching method / lecture hours per week (SWS):**
Prerequisites for the exam required; details will be announced at the beginning of the semester.	Written exam 120 minutes	• Lecture 2 SWS • Exercise 2 SWS

Prerequisites according to examination regulations:	**Recommended prerequisites:**
none	Modul *Computernetze*

Media:	**Literature:**
	Textbooks as indicated. Slides and paper copies as necessary.

Comments:

Computational Geometry

Summer

(in German: Computational Geometry)

Module-ID: FIN-INF-102201

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
CompGeom	6	Summer	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	false
Responsibility:	Prof. Dr. Stefan Schirra
Lecturer:	Prof. Dr. Stefan Schirra
Classes:	Lectures and exercises *Computational Geometry*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INF: Informatik Wahlpflicht (SPO 2027) - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. WIF: Informatik Wahlpflicht (SPO 2027) - M.Sc. DKE: Data Processing for Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. DE: Informatik Wahlpflicht (SPO 2027) - M.Sc. VC: Visual Computing - M.Sc. VC: Visual Computing (SPO 2027)

Intended learning outcomes:
Students know how to design and analyze algorithms for advanced geometric problems. They understand the basics of combinatorial and algebraic geometry.

Content:

- basics in combinatorial geometry
- basics in algebraic geometry

- duality
- algorithm design paradigms

Workload:
56 h classroom + 124 h independent work

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
active participation	Oral exam	• Lecture and Exercise (4 SWS)

Prerequisites according to examination regulations:	Recommended prerequisites:
keine	Basics in algorithmic geometry (for example, bachelor modul Grundzüge der Algorithmischen Geometrie)

Media:	Literature:
	• de Berg, Cheong, van Kreveld, Overmars; Computational Geometry • Devadoss, O'Rourke; Computational Geometry

Comments:

Introduction to Data Warehousing

Winter

(in German: Data Warehouse Technologies)

Module-ID: FIN-INF-102808

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
DWT	6	Winter	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	
Responsibility:	Gunter Saake
Lecturer:	David Broneske
Classes:	• Lecture *Introduction to Data Warehousing* • Exercise *Introduction to Data Warehousing*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. WIF: Informatik - M.Sc. DKE: Data Processing for Data Science - M.Sc. DE: Fachliche Spezialisierung

Intended learning outcomes:
The students ...

- understand the data warehousing approach
- understand technologies in the field of data warehouses
- can use data warehouse specific DBMS functionalities

- can design and develop data warehouse applications

Content:

- The data warehouse approach
- Architecture and differences to traditional Database Management
- The Extract-Transform-Load process
- OLAP and the Multidimensional data model
- Application of the model in database systems
- Query execution and optimization
- Index and Storage structures for data warehouses
- Buisiness Intelligence on data warehouses

Workload:
56 contact hours + 124 h self study

Pre-examination requirements:	**Type of examination:**	**Teaching method / lecture hours per week (SWS):**
	Written exam (120 min)	• 2 SWS Lecture • 2 SWS Exercise class

Prerequisites according to examination regulations:	**Recommended prerequisites:**
keine	Modules Datenbanken 1/Database Concepts and Datenbanken 2

Media:	**Literature:**
	Data Warehouse Technologien. Veit Köppen, Gunter Saake, Kai-Uwe Sattler. 2. Auflage, mitp-Verlag, 2014

Comments:

Datenbanken 2

Sommer

Datenbankimplementierungstechniken

(engl. Database Implementation Techniques)

Modulnummer: FIN-INF-120531

Kürzel	CP	Semester	Fachsem.	Dauer	Sprache	Niveau
DB II	6	Sommer	1.	1 Semester	deutsch	Master

Link zum LSF:	LSF
Zugang beschränkt:	
Verantwortung:	Gunter Saake
Dozent:in:	Gunter Saake
Lehrveranstaltungen:	• Vorlesung Datenbanken 2 • Übung Datenbanken 2
Verwendbarkeit:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. DKE: Data Processing for Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. VC: Computer Science

Angestrebte Lernergebnisse:

- Kenntnisse über die Funktionsweise von Datenbankmanagementsystemen
- Befähigung zum physischen Entwurf von Datenbanksyste-men
- Befähigung zur Administration und zum Tuning von Datenbanksystemen
- Befähigung zur Entwicklung von Komponenten von Datenbankmanagementlösungen
- Die Fähigkeit, erworbenes Wissen auf reale Datensätze zu übertragen, Implementierungsentscheidungen eigenständig zu treffen sowie die Eignung eingesetzter Algorithmen für praktische Anwendungsszenarien kritisch zu bewerten.

Inhalt:

- Aufgaben und Prinzipien von Datenbanksystemen
- Architektur von Datenbanksystemen
- Verwaltung des Hintergrundspeichers
- Dateiorganisation und Zugriffsstrukturen
- Zugriffsstrukturen für spezielle Anwendungen
- Basisalgorithmen für Datenbankoperationen
- Optimierung von Anfragen

Arbeitsaufwand:
56h Präsenz + 124h selbstständige ArbeitErfolgreiche Bearbeitung von Semesteraufgaben (Ausgabe zum Beginn des Semesters)

Prüfungsvorleistungen:	**Studien-/Prüfungsleistungen:**	**Lehrform / SWS:**
Erfolgreiche Bearbeitung von Semesteraufgaben (Ausgabe zum Beginn des Semesters)	Klausur (120 min.)	• 2 SWS Vorlesung • 2 SWS Übung

Voraussetzungen nach Prüfungsordnung:	**Empfohlene Voraussetzungen:**
keine	Datenbanken 1

Medienformen:	**Literatur:**
	Datenbanken: Implementierungstechniken. Gunter Saake, Kai-Uwe Sattler, Andreas Heuer, 4. Auflage mitp-Verlag, Bonn, 2019, ISBN: 978-3-95845-779-9

Hinweise:

Distributed Data Management

Winter

(in German: Distributed Data Management)

Module-ID: FIN-INF-102404

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
DDM	6	Winter	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	false
Responsibility:	Gunter Saake
Lecturer:	Eike Schallehn
Classes:	• Lecture *Distributed Data Management* • Exercise *Distributed Data Management*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. DKE: Data Processing for Data Science - M.Sc. DE: Fachliche Spezialisierung - M.Sc. VC: Computer Science

Intended learning outcomes:
The students ...

- know basic principles and advantages of distributed data management
- can implement distributed databases
- understand query and transaction processing in distributed and parallel database systems

- optimize the run-time performance and satisfy requirements regarding reliability and availability of distributed systems

Content:

- Overview and classification of distributed data management (distributed DBMS, parallel DBMS, fedrated DBMS, P2P)
- Distributed DBMS: architecture, distribution design, distributed query processing and optimization, distributed transactions, and transactional replication
- Parallel DBMS: fundamentals of parallel processing, types of parallelization in DBMS, parallel query processing

Workload:
56 h contact hours + 124 h self-study

Pre-examination requirements:	**Type of examination:**	**Teaching method / lecture hours per week (SWS):**
To be eligible to take the exam, you must have completed certain prerequisites. Further details will be announced in the first lecture.	Written exam (120 min)	• Vorlesung 2 SWS • Übung 2 SWS

Prerequisites according to examination regulations:	**Recommended prerequisites:**
none	Database introduction course

Media:	**Literature:**

Comments:

In-Memory and Cloud-Technologies

Winter

(in German: In-Memory und Cloud-Technologien)

Module-ID: FIN-INF-120506

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
IMCloud	6	Winter	starting at 1.	2 Semester	english	Master

Link:	LSF
Limited accessability:	
Responsibility:	Hon. Prof. Dr. Alexander Zeier
Lecturer:	Hon. Prof. Dr. Alexander Zeier
Classes:	• Vorlesung *In-Memory und Cloud-Technologien 1* • Vorlesung *In-Memory und Cloud-Technologien 2*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Informatik - M.Sc. DKE: Data Processing for Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. VC: Computer Science

Intended learning outcomes:
Die Studierenden ...

- können Methoden ihres Fachs einschätzen und kreativ weiterentwickeln.

- können sich neues Wissen eigenständig aneignen und für sich nutzbar machen.
- können bei unbekannten Aufgaben eigene Ideen einbringen und Entscheidungen treffen.
- können für neue Aufgaben geeignete Lösungen wählen, anwenden und anschlieÃŸend beurteilen.
- kÃ¶nnen selbststÃ¤ndig wissenschaftlich arbeiten.
- haben ein Verständnis für ausgewählte Vertiefungsgebiete der Wirtschaftswissenschaften, der Wirtschaftsinformatik und der Informatik und für ihre Zusammenhänge.
- können existierende Methoden von Data Science für neuartige Probleme anpassen.
- haben vertiefte, spezialisierte Kenntnisse in der Informatik und können diese in ingenieurwissenschaftlichen Domänen anwenden.
- können in interdisziplinären Projekten Digitalisierungslösungen für komplexe ingenieurwissenschaftliche Systeme beitragen.

Content:
In-Memory Technologie und Anwendungen mit Focus auf SAP HANA:

- Erläuterung der In-Memory-Technologie mit Focus auf SAP HANA
- Zeilen- versus Spaltenhauptspeicherdatenbanken
- Komprimierungs-, Partitionierungs- und Indexierungsansätze
- Google Cloud Technologie und Services
- Einsatz z.B. von Anthos, Bigquery, und AutoML
- Entwicklung von Hochverfügbarkeitslösungen und Backupstrategien
- Erweiterung des Datenlayouts ohne Downtime
- Migrationsansätze für Projekte in denen In-Memory Datenbanken eingesetzt werden

Workload:
Präsenzzeiten = 56 h:

- 56 h Vorlesung
- Selbstständiges Arbeiten = 64 h:
- 60 h Vorbereitung auf die Vorlesung und Lesen der empfohlenen Literatur

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
	Eine mündliche Prüfung am Ende des Kurses	Vorlesung (4SWS)

Prerequisites according to examination regulations:	Recommended prerequisites:

keine	• Datenbanken I • Datenbanken II

Media:	**Literature:**
	Plattner, H., Zeier, A.: In-Memory Data Management: Technology and Applications, Springer Verlag, 2. Auflage, Mai 2012, ISBN 978-3642295744 Whitepaper HANA on Intel: Three Steps to Reinvent Your Enterprise as a Digital Disrupterâ€ von Prof. Dr. Alexander Zeier & Intel CTO Enterprise Ed Goldman, 2016. Cloud Computing, Blog (July 2020) zu Digital Decoupling. Title: Trapped by legacy systems, CIOs look for a way out https://www.accenture.com/us-en/blogs/cloud-computing/zeier-digitaldecoupling-sap-google-cloud

Comments:
Start jeweils zum Wintersemester.

Seminar 'Advanced Topics of KMD'

every

(in German: Seminar 'Advanced Topics of KMD')

Module-ID: FIN-INF-120330

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
AdvKMD_Seminar	6	every	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	false
Responsibility:	Myra Spiliopoulou
Lecturer:	Myra Spiliopoulou
Classes:	Seminar *AdvKMD_Seminar*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INF: Schlüssel- und Methodenkompetenzen - M.Sc. INGINF: Informatik - M.Sc. INGINF: Schlüssel- und Methodenkompetenzen - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. WIF: Informatik - M.Sc. WIF: Schlüssel- und Methodenkompetenzen - M.Sc. DKE: Learning Methods and Models for Data Science - M.Sc. DKE: Data Processing for Data Science - M.Sc. DKE: Applied Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. VC: Computer Science

Intended learning outcomes:
When successfully completing this seminar, the students:

- know how to collect literature on a specific topic, and can judge which literature is relevant and which is not
- can compare mining methods, workflows and frameworks that address a specific scientific topic, and can rank them on given criteria
- can formulate such criteria themselves
- can critically discuss the advantages and caveats of a published mining method
- can summarize the papers they collected, their comparisons and critical discussion in an essay
- can present the papers they collected, their comparisons and critical discussion in a pre-specified amount of time and in a way understandable to both an audience that has read the papers and to an audience that has not read, and they can answer questions

Content:
CONTENT: Topics on 'Advanced Knowledge Management and Discovery' for business applications, engineering applications and applications in healthcare; all topics refer to mining algorithms for static or dynamic data **STRUCTURE:** Each student receives a topic as assignment. The assignment encompasses:

- one or more 'seed' papers in the topic's area
- a series of questions to be answered, and which concern state of the art (SOTA) methods in the topic area, challenges addressed by these methods, evaluation criteria on the performance of these methods, evaluation procedures and datasets

The student must:
1. collect additional literature from the topic area in a transparent manner
2. compare the scientific advances in the collected literature in order to answer the scientific questions
3. critically discuss and rank the methods compared in the previous step
4. present the collected literature, the comparisons and the results in class
5. write an essay on them

Workload:

- 28 hours Seminar+Consultations in class
- 124 hours self-study work on scientific papers

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
	Referat	Seminar (2 SWS)

Prerequisites according to examination regulations:	Recommended prerequisites:

none	• Familiarity with advanced mining methods • Familiarity with procedures for the evaluation of models and the comparison of models • Underpinnings of scientific writing (e.g. through a bachelor seminar or a bachelor thesis)

Media:	**Literature:**
	The literature of the seminar covers several topics. For each topic, it consists of the papers assigned to each student and the paper that the student collects on that topic. The topics change in each semester.

Comments:
The seminar contains several topics. The mapping of the module (see field 'Verwendbarkeit') depends on the topic assigned to a specific student.

VLBA – Cloud DevOps Technologies

Winter

(in German: VLBA – Cloud DevOps Technologies)

Module-ID: FIN-INF-120478

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
VLBA-CDOT	9	Winter	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessability:	true
Responsibility:	Prof. Dr. Klaus Turowski
Lecturer:	Prof. Dr. Klaus Turowski
Classes:	• '- Lecture *VLBA Cloud DevOps Technologies* ◦ Exercise *VLBA Cloud DevOps Technologies* ◦ Consultation *VLBA - Cloud DevOps Technologien (Consultation)* ◦ Tutorial *VLBA - Cloud DevOps Technologien (Tutorial)*
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. WIF: Informatik - M.Sc. DKE: Data Processing for Data Science - M.Sc. DKE: Applied Data Science - M.Sc. DE: Methoden der Informatik - M.Sc. VC: Computer Science

Intended learning outcomes:
Students ...

- know and understand specialized subject content that expands and deepens the Bachelor's degree.
- can independently analyze problems and identify alternative solutions. -know how to work with UNIX operating systems.
- are experienced in the theory and handling of container-based virtualization technologies such as Docker.
- know how to use higher programming languages (Python).
- know how to use various configuration and automation tools and languages such as Ansible, Salt and Terraform.
- have practical and theoretical knowledge of testing IT systems, particularly in relation to essential DevOps concepts such as Continuous Integration and Continuous Delivery.
- have the ability to design, create, test, commission and support IT systems.

Content:
In view of highly networked applications, big data and cloud computing, the careful planning and construction of architectures and landscapes of the corresponding information systems is more important than ever. In many cases, the lifecycle of a system does not end with the delivery of the solution, but rather the subsequent operation, monitoring and maintenance have become an essential part of this process. At this point, sophisticated paradigms and methods are required to facilitate the continuous development and operation of these systems while preventing errors, failures and other disruptions. The course is designed to teach the fundamentals as well as initial practical experience in the development and Table of Contents Part A (Winter) Page 248 - Part A Table of Contents Part B (Full) operation (DevOps) of systems in conjunction with dedicated cloud technologies. In addition to the theoretical basics, essential concepts and technologies are discussed and applied that enable the continuous integration, delivery and testing of corresponding systems.

Workload:
Attendance = 84 h: 21 h Lecture 21 h Exercise 21 h Consultation 21 h Tutorial Independend work = 186 h: 186 h working on several assignments that build on each other

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
In order to qualify for the final project, certain requirements must be fulfilled. Details will be announced in the first lecture.	Hausarbeit	Vorlesung (2 SWS) Übung (2 SWS)

Prerequisites according to examination regulations:	Recommended prerequisites:
keine	

Media:	Literature:

Comments:

Wissenschaftliches Individualprojekt

jedes

(engl. Individual Scientific Project)

Modulnummer: FIN-INF-120301

Kürzel	CP	Semester	Fachsem.	Dauer	Sprache	Niveau
WIP	6	jedes	ab 1.	1 Semester	deutsch	Master

Link zum LSF:	LSF
Zugang beschränkt:	
Verantwortung:	Studiendekan:in der FIN
Dozent:in:	Alle Dozenten der FIN
Lehrveranstaltungen:	keine

Verwendbarkeit:	- M.Sc. INF: Informatik - M.Sc. INF: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. INF: Projekte (SPO 2027) - M.Sc. INGINF: Informatik - M.Sc. INGINF: Ingenieurinformatik - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. WIF: Informatik - M.Sc. WIF: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. WIF: Projekte (SPO 2027) - M.Sc. DKE: Learning Methods and Models for Data Science - M.Sc. DKE: Data Processing for Data Science - M.Sc. DKE: Applied Data Science - M.Sc. DKE: Projects (SPO 2027) - M.Sc. DE: Human Factors - M.Sc. DE: Methoden des Digital Engineering - M.Sc. DE: Methoden der Informatik - M.Sc. DE: Fachliche Spezialisierung - M.Sc. DE: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. DE: Projekte (SPO 2027) - M.Sc. VC: Visual Computing - M.Sc. VC: Computer Science - M.Sc. VC: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. VC: Projekte (SPO 2027)

Angestrebte Lernergebnisse:
Die Studierenden ...

- arbeiten selbstständig an einer wissenschaftlichen Fragestellung
- arbeiten sich selbstständig in ein wissenschaftliches Spezialgebiet ein
- erarbeiten vertiefte Kenntnisse auf einem wissenschaftlichen Spezialgebiet
- präsentieren und interpretieren ihre Ergebnisse in mündlicher und/oder schriftlicher Form
- können ihren Erfolg und die Bedeutung ihrer Ergebnisse einschätzen
- beschreiben die Auswirkungen ihrer Entscheidungen auf den Verlauf und die Ergebnisse des Projektes

Inhalt:
Die Studierenden bearbeiten in selbstständiger Arbeit eine individuell vereinbarte, wissenschaftliche Fragestellung unter Anleitung eines Hochschullehrers. Im Projekt entwickeln die Studierenden eine eigenständige Informatik-Lösung. Dadurch erwerben sie ein detailliertes und kritisches Verständnis in einem Spezialbereich der Informatik. Dieses Modul wird von unterschiedlichen Hochschullehrern implementiert. Die fachlichen Inhalte sind daher angebotsspezifisch.

Arbeitsaufwand:
180h selbstständige Arbeit

Prüfungsvorleistungen:	Studien-/Prüfungsleistungen:	Lehrform / SWS:
	Wissenschaftliches Projekt	Angeleitetes wissenschaftliches Individualprojekt

Voraussetzungen nach Prüfungsordnung:	Empfohlene Voraussetzungen:
keine	

Medienformen:	Literatur:

Hinweise:
Projekte außerhalb der FIN müssen von Studiengangsleiter abgesegnet werden.