

Module im Bereich: Wirtschaftsinformati k

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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 accessibility:	
Responsibility:	Gunter Saake
Lecturer:	David Broneske
Classes:	• Lecture <i>Introduction to Data Warehousing</i> • Exercise <i>Introduction to Data Warehousing</i>
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
- Business 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:

Design-Projekt

Sommer

(engl. Design Project)

Modulnummer: FIN-INF-120520

Kürzel
DSP

CP
6

Semester
Sommer

Fachsem.
ab 1.

Dauer
1 Semester

Sprache
deutsch

Niveau
Master

Link zum LSF:

[LSF](#)

Zugang beschränkt:

Verantwortung:

Hans-Knud Arndt

Dozent:in:

Hans-Knud Arndt

Lehrveranstaltungen:

- Seminar *Design Projekt*
- Übung *Design Projekt*

Verwendbarkeit:

- 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. DKE: Applied Data Science
- M.Sc. DE: Human Factors
- M.Sc. VC: Schlüssel- und Methodenkompetenzen

Angestrebte Lernergebnisse:

Absolvent*innen dieses Moduls...

- entwickeln ein Verständnis für Industrie-Design
- setzen sich mit den „Zehn Thesen des Guten Designs“ von Dieter Rams auseinander und sind in der Lage diese auf Projekte anzuwenden
- entwickeln ein Verständnis für das Design aktueller IT-Produkte
- sind in der Lage, das Design von aktuellen IT-Produkte zu entwickeln und zu bewerten

Inhalt:

- Die Teilnehmer*innen sollen im Rahmen dieser Lehrveranstaltung ihre neu gewonnenen Erkenntnisse in Bezug auf Design praktisch auf IT-Produkte anwenden. Hierbei werden die von Dieter Rams entwickelten „Zehn Thesen des Guten Designs“ eingesetzt.
- Darüber hinaus werden weitere Ansätze, wie zum Beispiel von John Maeda: "Simplicity: Die zehn Gesetze der Einfachheit" angewendet.

Arbeitsaufwand:

Präsenzzeiten:

- 2 SWS Seminar = 28h
- 2 SWS Übung = 28h

Selbstständiges Arbeiten:

- Vor- und Nachbereitung Vorlesung Entwicklung von Lösungen für die Übung 124h

180h = 4 SWS = 56h Präsenzzeit + 124h selbstständige Arbeit

Prüfungsvorleistungen:	Studien-/Prüfungsleistungen:	Lehrform / SWS:
	Hausarbeit	Seminar (2 SWS) Übung (2 SWS)

Voraussetzungen nach Prüfungsordnung:	Empfohlene Voraussetzungen:
keine	

Medienformen:	Literatur:

Hinweise:

MLOps for Small Language Model Applications

Winter

(in German: MLOps for Small Language Model Applications)

Module-ID: FIN-INF-120515

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

Link:	LSF
Limited accessibility:	true
Responsibility:	Prof. Dr. Klaus Turowski, Dr.-Ing. Abdulrahman Nahhas
Lecturer:	Prof. Dr. Klaus Turowski, Dr.-Ing. Abdulrahman Nahhas
Classes:	Vorlesung + Übung + Tutorial
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. WIF: Informatik - 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 Large Language Models (LLM) and machine learning development and operation.
- can independently analyze problems and identify alternative solutions.

- know how to work with large language models following proper machine learning development and operation practices.
- 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 to automate the development and operation of LLM solutions.
- have practical and theoretical knowledge of testing LLM-solutions, particularly in relation to essential DevOps concepts such as Continuous Integration and Continuous Delivery, LLMOps, testing, and system landscape.
- have the ability to design, create, test, commission, and support LLM solutions for business problems.

Content:

The generalization and standardization of the Large Language Model Operations (LLMOps) life cycle is crucial for the effective adoption and management of Large Language Models (LLMs) in a business context. In many cases, the lifecycle of an LLM solution does not end with the delivery an initial solution; rather, subsequent model improvement, operation, monitoring, and maintenance have become essential parts 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 provide initial practical experience in the development of LLM solutions and technologies, in conjunction with dedicated cloud-native technologies and an emphasis on small LLMs (SML) that are edge-suitable, may be operated on premise, or are ressource-efficient. In addition to the theoretical basics, essential concepts and technologies are discussed and applied that enable the continuous improvement, integration, delivery, and testing of LLM solutions for business problems.

Workload:

Attendance:

21 h lecture / 63 h exercise Independent work: 207 h

1. Preparation and follow-up of lecture & exercise
2. Development of an LLM-based sotion following LLMOps praticies to address a business problems

9 x30h (63 h attendance time + 207 h independent work)

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
	Report	Vorlesung (2 SWS) Übung (2 SWS)

Prerequisites according to examination regulations:	Recommended prerequisites:

1. VLBA: Systemarchitectures or 2. VLBA Cloud DevOps Technologies or 3. Version control systems, DevOps praticies (CI/CD), Containerization technologies, and python.	1. VLBA: Systemarchitectures or 2. VLBA Cloud DevOps Technologies or 3. Version control systems, DevOps praticies (CI/CD), Containerization technologies, and python.
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Media:	Literature:

Comments:

Management of Global Large IT-Systems in International Companies

Summer

(in German: Management of Global Large IT-Systems in International Companies)

Module-ID: FIN-INF-120315

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

Link:	LSF
Limited accessibility:	
Responsibility:	Gunter Saake
Lecturer:	Karl-Albert Bebbber, Wolfgang Stockhausen
Classes:	• Block lecture <i>Management of Global Large IT-Systems in International Companies</i> • Block Exercise class <i>Management of Global Large IT-Systems in International Companies</i>

Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. DKE: Applied Data Science - M.Sc. DE: Human Factors - M.Sc. DE: Methoden der Informatik - M.Sc. DE: Fachliche Spezialisierung - M.Sc. VC: Computer Science
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Intended learning outcomes:

Students are able to ...

- understand the fundamentals of IT strategy and analyze its significance for businesses.
- describe methods for developing and implementing IT strategies.
- apply project management methodologies such as PRINCE2 and agile approaches in IT projects.
- understand multi-project management, program management and portfolio management in corporate environments.
- apply change management models such as ADKAR to manage organizational transformations.
- understand the importance of IT governance and compliance for corporate structures and regulatory requirements.
- describe stakeholder management and intercultural communication in global IT projects.
- identify risks and quality requirements in IT projects and develop appropriate control measures.
- explain data governance concepts and assess their significance for data protection, IT security, and regulatory compliance.
- describe the role of data quality, metadata management and master data management (MDM) in corporate IT.
- model, analyze, and optimize IT-supported business processes, particularly through the use of BPMN.
- understand Identity & Access Management (IAM) and evaluate its implementation in enterprises.
- explain security aspects such as authentication, authorization, Single Sign-On (SSO), and two-factor authentication (2FA), as well as best practices in enterprise security management.
- assess IT security strategies and cybersecurity measures, including risk mitigation techniques.
- understand the importance of reference data management and data integration for corporate processes.
- evaluate agile methodologies such as Scrum in IT transformation projects and compare them with traditional waterfall approaches.
- understand risk and quality management processes in IT environments, including testing methodologies, compliance frameworks, and risk mitigation strategies.
- analyze and apply IT service delivery models in Shared Service Centers.

Content:

- Business Process Management and Modeling
- Process Analysis and Optimization/Standardization
- Identity and Access Management (IAM)
- Quality and Risk Management in IT Operations
- Testing and Software Quality Assurance, including Documentation
- Agile vs. Waterfall Project Management in IT
- IT Service Delivery and Shared Service Center Management
- Project and Program Management (PRINCE2 i. a.)
- Stakeholder Management in IT Projects
- Change Management (ADKAR, Organizational and Employee Transformation)
- Data Governance (Strategy, Policies, Processes and Data Quality)
- IT Strategy – Business as a Driver for IT (Balanced Scorecard)
- IT Investments and Business Decision-Making
- Insights from Ongoing IT Projects by Public Accountants and IT Project Leads from Major International Companies

Workload:

56 contact hours + 124 h self study

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
Requirements for exam admission will be announced in the first lecture	Written Exam (120 min)	• 2 SWS Blockvorlesung • 2 SWS Blockübung

Prerequisites according to examination regulations:	Recommended prerequisites:
keine	Knowledge about IT-Systems and Business administration

Media:	Literature:

Comments:

Recent Topics in Business Informatics

every

(in German: Recent Topics in Business Informatics)

Module-ID: FIN-INF-120318

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
RTBI	6	every	2.	1 Semester	english	Master

Link:	LSF
Limited accessibility:	false
Responsibility:	Prof. Dr. Klaus Turowski
Lecturer:	Dr. Daniel Staegemann , Abdulrahman Nahhas
Classes:	Seminar <i>RTBI</i>
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INF: Schlüssel- und Methodenkompetenzen - M.Sc. INGINF: Informatik - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. WIF: Schlüssel- und Methodenkompetenzen - M.Sc. DKE: Applied Data Science - M.Sc. DE: Human Factors - M.Sc. DE: Methoden der Informatik - M.Sc. DE: Fachliche Spezialisierung - M.Sc. VC: Computer Science

Intended learning outcomes:

Students ...

- can acquire new knowledge independently through self-sufficient research and consultation of thematically relevant scientific literature and make it usable for

themselves.

- can write a scientific paper almost independently and with only a small amount of support and present the final result.
- can convey knowledge from a subject area of their choice as part of a specialist presentation, explain the research results they have achieved and defend the arguments they have put forward in a scientific discussion.
- know the steps involved in writing a scientific paper, from finding a specific topic to presenting it at a conference.
- have carried out the necessary steps for crafting a scientific publication themselves and have developed an understanding of them.

Content:

- Research, Literature Search, Citation & Plagiarism
- Scientific methods
- Hands-On-Guidance
- Introduction to selected Business Informatics topics

Workload:

presence = 40 hr.:

40 h lecture with integrated exercise

independent work = 140 hr:

Follow-up of the lecture, write paper and review, and present paper.

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
	Referat	Seminar (4SWS)

Prerequisites according to examination regulations:	Recommended prerequisites:
none	Basics of scientific writing

Media:	Literature:

Comments:

Recommenders

Summer

Learning Methods and Evaluation Methods for Recommenders

(in German: Recommenders - Master level)

Module-ID: FIN-INF-120525

Abbreviation	Credit Points	Semester	Term	Duration	Language	Level
RECSYS-M	9	Summer	starting at 1.	1 Semester	english	Master

Link:	LSF
Limited accessibility:	false
Responsibility:	Myra Spiliopoulou
Lecturer:	Myra Spiliopoulou
Classes:	• Lecture <i>Recommenders</i> • Exercise class <i>Recommenders</i>
Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. DKE: Learning Methods and Models for Data Science - M.Sc. DE: Methoden des Digital Engineering - M.Sc. DE: Methoden der Informatik - M.Sc. VC: Computer Science

Intended learning outcomes:

When successfully completing this module, the students have acquired soft skills and technical expertise, as follows: **SOFT SKILLS:** They

- have learned how to critically discuss and value a scientific paper

TECHNICAL EXPERTISE: They

- comprehend the business context of recommenders
- comprehend the different types of recommenders, their advantages and disadvantages from the business perspective and from the mining perspective and are familiar with advanced recommendation methods
- have acquired advanced insights on how to critically evaluate a recommender from the mining perspective and the business perspective
- understand why adaption is necessary in recommenders and comprehend the behaviour of temporal methods for recommenders

and have thus acquired skills they need in order to critically appreciate off-the-shelf or state-of-the-art methods and to design workflows that encompass recommender learning, tuning and evaluation

Content:

The course consists of two blocks:

- Block 1 is on Fundamentals of Recommenders and has multiple parts: (1.1) recommender goals and workflows, (1.2) simple recommendation methods, (1.3) evaluation mechanisms, (1.4) recommender adaption on a stream
- Block 2 covers advanced topics of recommenders: students read and critically discuss papers in class

Workload:

- 28 Std/hours: Vorlesung/Lecture - in presence (lecture class: 2 hours per week, 28 hours)
- 28 Std/hours: Übung/Exercises - in presence (exercise class: 2 hours per week, 28 hours)
- 214 Stunden: Individual working time on
 - Preparation for lectures and exercise classes
 - Reading and understanding the articles provided
 - Discussion of the articles in class

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
A minimum number of points must be achieved during the classes	Schriftliche Prüfung (Klausur)	• Vorlesung (2 SWS) - Lecture class (2 hours-per-week) • Übung (2 SWS) - Exercise class (2 hours-per-week)

Prerequisites according to examination regulations:	Recommended prerequisites:
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keine	• Data Mining I • Machine Learning • Data Mining II • Introduction to Deep Learning • Advanced English skills • Reading of scientific papers, as acquired eg in a bachelor seminar
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Media:	Literature:
	• Literature for Block 1: selected chapters from the 'Recommender Systems Handbook' in the editions: ◦ Recommender Systems Handbook by Francesco Ricci, Lior Rokach and Bracha Shapira (editors), SPRINGER (2015), 2nd edition, https://doi.org/10.1007/978-1-4899-7637-6 ◦ Recommender Systems Handbook by Francesco Ricci, Lior Rokach and Bracha Shapira (editors), SPRINGER (2022), 3rd edition, https://doi.org/10.1007/978-1-0716-2197-4 ◦ Further cited literature, including scientific articles and use cases are cited at the beginning of each unit. • Literature for Block 2: the papers for the discussions in class will be announced during the course

Comments:

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 accessibility:	false
Responsibility:	Myra Spiliopoulou
Lecturer:	Myra Spiliopoulou
Classes:	Seminar <i>AdvKMD_Seminar</i>
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)
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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.

Seminar on Advanced Topics of Predictive Maintenance

every

(in German: Seminar on Advanced Topics of Predictive Maintenance)

Module-ID: FIN-INF-120489

Abbreviation PredMa_Masterseminar	Credit Points 6	Semester every	Term starting at 1.	Duration 1 Semester	Language english	Level Master
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Link:	LSF
Limited accessibility:	true
Responsibility:	Prof. Dr.-Ing. Benjamin Noack, Prof. Dr. Myra Spiliopoulou
Lecturer:	Prof. Dr.-Ing. Benjamin Noack, Prof. Dr. Myra Spiliopoulou
Classes:	Seminar <i>Advanced Topics of Predictive Maintenance</i>

Applicability in curriculum:	- M.Sc. INF: Informatik - M.Sc. INF: Schlüssel- und Methodenkompetenzen - M.Sc. INF: Informatik Wahlpflicht (SPO 2027) - M.Sc. INF: Schlüssel- und Methodenkompetenz (SPO 2027) - 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. WIF: Informatik Wahlpflicht (SPO 2027) - M.Sc. WIF: Wirtschaftsinformatik (SPO 2027) - M.Sc. WIF: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. DKE: Learning Methods and Models for Data Science - M.Sc. DKE: Applied Data Science - M.Sc. DE: Methoden des Digital Engineering - M.Sc. DE: Methoden der Informatik - M.Sc. DE: Digital Engineering (SPO 2027) - M.Sc. DE: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. VC: Computer Science - M.Sc. VC: Computer Science (SPO 2027)
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Intended learning outcomes:

Students who complete the course ...

- read scientific articles given to them on introductory topics of predictive maintenance
- discuss these articles and reflect on them
- compare the methods that appear in these articles and discuss the pros and contra of each method in comparison to other methods
- summarize article contents on predictive maintenance in a report and present them
- formulate questions on these articles and answer questions formulated by other seminar participants

Content:

In this seminar, the participants will learn about

- challenges and methods for data acquisition in industrial processes
- data analysis tools in predictive maintenance
- process modeling, fault detection, and state prediction for industrial applications

Workload:

28h in presence (consultation meetings, presentations) + 156 h self study

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
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	Referat	Seminar (2 SWS)
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Prerequisites according to examination regulations:	Recommended prerequisites:
none	• Signal and information processing • Learning algorithms • Underpinnings of engineering sciences and/or business informatics (some topics only) • Principles of scientific writing

Media:	Literature:
	Literature depends on topic assignment and is given to each student together with the assignment

Comments:

Service Engineering

Sommer

(engl. Service Engineering)

Modulnummer: FIN-INF-120530

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

Link zum LSF:	LSF
Zugang beschränkt:	
Verantwortung:	Prof. Dr. Frank Ortmeier
Dozent:in:	Prof. Dr. Andreas Schmietendorf (HWR Berlin)
Lehrveranstaltungen:	• Vorlesung <i>Service Engineering</i> • Übung <i>Service Engineering</i>
Verwendbarkeit:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. WIF: Informatik - M.Sc. DKE: Applied Data Science

Angestrebte Lernergebnisse:

Die Studierenden ...

- kennen die Auswirkungen serviceorientierter Architekturansätze auf den gesamten Lebenszyklus derart implementierter Lösungen,
- kennen Herausforderungen (Technologie, Prozesse, Organisation, ...) serviceorientierter Integrationslösungen und einhergehende Lösungsalternativen,
- können benötigte Services modellgetrieben herleiten und erstellen bzw. Kriterien basierend bewerten (make or buy),
- kennen aktuelle Technologieansätze zur Implementierung benötigter Services und können ausgewählte Vertreter prototypisch anwenden,
- können Servicekompositionen aus Sicht der Modellierung und Implementierung (Low- und High -Code) erstellen bzw. das benötigte Management anwenden.

Inhalt:

Überblick

- Die Vorlesung vermittelt zunächst die geschäfts-, organisations- und prozessbezogenen Ursachen API-basierter Integrationslösungen. In diesem Zusammenhang wird auf domänenspezifische (Referenz-) Modellansätze aus dem industriellen Umfeld (Telekommunikation, Banken, Versicherungen, ...) eingegangen.
- Darauf aufbauend lernen die Studierenden die Funktionen von Integrationsplattformen (u.a. API-Management) kennen, welche API-Kompositionen über deren gesamten Lebenszyklus unterstützen bzw. verwalten.
- Mit Hilfe der ersten Komplexübung erfolgt dann eine quantitative Bewertung im Internet angebotenen Public- bzw. Open APIs.
- Eine weitere alternativ gestaltbare Komplexübung beschäftigt sich mit der Spezifikation, Modellierung, Entwicklung und Einbindung webbasierter APIs in (ggf. mobile) Applikationsszenarien.
- Im Mittelpunkt der abschließenden Komplexübung steht die Komposition von APIs, wobei abermals ein eigener Schwerpunkt (Modellsicht, Implementierung, Management) gewählt werden kann.

Themen:

- Integrationslösungen als Treiber der Digitalisierung
- Integrieren statt Implementieren
- Basistechnologien für Web-APIs (Public- und Open APIs)
- Spezifikation, Entwicklung und Management von Web-APIs
- Prozess-Modellierung und -Implementierung (API-Komposition)

Arbeitsaufwand:

56 h Präsenz + 124 h selbstständige Arbeit

Prüfungsvorleistungen:	Studien-/Prüfungsleistungen:	Lehrform / SWS:
	Mündliche Prüfung	• 2 SWS Vorlesung • 2 SWS Übung

Voraussetzungen nach Prüfungsordnung:	Empfohlene Voraussetzungen:
keine	Software Engineering

Medienformen:	Literatur:

- | | |
|--|---|
| | <ul style="list-style-type: none">• Hartenstein, S.; Nadobny, K.; Schmidt, S.; Schmietendorf, A.: Sicherheits- und Compliance-Management im Lebenszyklus von Web APIs, Logos-Verlag, Berlin, März 2020,• Nitze, A.; Schmietendorf, A.: Bewertungsaspekte bei der agilen SW-Entwicklung ..., Logos Verlag, Berlin 2014• Schmietendorf, A.; Knuth, M.: Aspekte des Software Engineerings im Diskurs einer Low-Code orientierten Softwareentwicklung, Logos Verlag, Berlin 2024• Sneed, H.; Sneed, S.: Web-basierte Systemintegration, Vieweg-Verlag, Braunschweig/Wiesbaden 2003• Spichale, K.: API-Design, Praxishandbuch für Java-und Webservice-Entwickler, dpunkt.verlag, 2017• Tilkov, S. et al.: REST und HTTP, dpunkt.verlag, Heidelberg 2015 |
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Hinweise:

Umweltmanagementinformationssysteme

Sommer

(engl. Environmental Management Information Systems)

Modulnummer: FIN-INF-120257

Kürzel
UMIS

CP
6

Semester
Sommer

Fachsem.
ab 1.

Dauer
1 Semester

Sprache
deutsch

Niveau
Master

Link zum LSF:	LSF
Zugang beschränkt:	
Verantwortung:	Hans-Knud Arndt
Dozent:in:	Hans-Knud Arndt
Lehrveranstaltungen:	• Vorlesung <i>Umweltmanagementinformationssysteme</i> • Übung <i>Umweltmanagementinformationssysteme</i>
Verwendbarkeit:	- M.Sc. INF: Informatik - M.Sc. WIF: Wirtschaftsinformatik

Angestrebte Lernergebnisse:

Die Studierenden ...

- setzen sich mit dem Spannungsfeld von Umweltaspekten, umweltorientierter Leistung und Umweltinformation auseinander
- kennen methodische Herangehensweisen zur Messung Umweltaspekten und umweltorientierter Leistung
- sind in der Lage die rechtlichen Folgen mangelnder Umweltleistung zu erfassen
- kennen methodische Herangehensweisen zur effizienten Erfassung, Verwaltung und Nutzung von Metadaten und Daten eines Umweltmanagements

- setzen sich mit der Einführung von Umweltmanagementinformationssystemen in Organisationen auseinander

Inhalt:

- Grundlagen zu Umweltmanagementsystemen
- Gesetzliche und andere Forderungen des Umweltschutzes
- Methoden, Werkzeuge und Normen zu Umweltmanagementsystemen
- Konzeption und Einführung von Umweltmanagementinformationssystemen

Arbeitsaufwand:

- 56h Präsenzzeit (Vorlesung + Übung)
- 124h selbstständige Arbeit (Vor- und Nachbereitung Vorlesung, Entwicklung von Lösungen in der Übung)

Prüfungsvorleistungen:	Studien-/Prüfungsleistungen:	Lehrform / SWS:
Um an der Prüfung teilnehmen zu können, sind Prüfungsvorleistungen erforderlich. Details werden in der ersten Vorlesung bekannt gegeben.	Mündliche Prüfung	Vorlesung (2 SWS) Übung (2 SWS)

Voraussetzungen nach Prüfungsordnung:	Empfohlene Voraussetzungen:
keine	

Medienformen:	Literatur:

Hinweise:

VLBA - Systemarchitekturen

Sommer

(engl. VLBA: Systemarchitectures)

Modulnummer: FIN-INF-120252

Kürzel	CP	Semester	Fachsem.	Dauer	Sprache	Niveau
VLBA-SysA	9	Sommer	ab 1.	1 Semester	deutsch	Master

Link zum LSF:	LSF
Zugang beschränkt:	true
Verantwortung:	Prof. Dr. Klaus Turowski
Dozent:in:	Prof. Dr. Klaus Turowski
Lehrveranstaltungen:	• Vorlesung <i>VLBA: Systemarchitekturen</i> • Übung <i>VLBA: Systemarchitekturen</i>
Verwendbarkeit:	- M.Sc. INF: Informatik - M.Sc. INGINF: Informatik - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. DKE: Applied Data Science - M.Sc. DE: Fachliche Spezialisierung - M.Sc. VC: Computer Science

Angestrebte Lernergebnisse:

Die Studierenden ...

- sammeln Know-how über die Architektur von Systemlandschaften.
- wissen wie Geschäftsprozesse und IT-Ressourcen miteinander verbunden werden können (Wie spiegelt sich dies in der (System-)Architektur wider).
- kennen die Unterschiede zwischen monolithischen und serviceorientierten Architekturen bei der Entwicklung und Integration von Anwendungssystemen für Unternehmen.
- wissen, wie man Anwendungskomponenten zur Unterstützung verschiedener Geschäftsprozesse ableitet.
- wissen wie Komponenten und Dienste als Elemente einer Systemarchitektur systematisch identifiziert werden.

- wissen wie Cloud Computing-Technologien zur Unterstützung von Geschäftsprozessen genutzt werden können.
- kennen die Unterschiede zwischen den verschiedenen Cloud- Patterns und den Cloud-Service-Modellen.
- lernen die Cloud Application Architecture kennen und erfahren, wie die Microservice-Architektur die klassische serviceorientierte Architektur in Cloud-Umgebungen ergänzt.
- können sich selbstständig neues Wissen aneignen und für sich nutzbar machen.
- können bei ungewohnten Aufgabenstellungen eigene Ideen einbringen und Entscheidungen treffen.
- können für neue Aufgabenstellungen geeignete Lösungen auswählen, anwenden und anschließend bewerten.
- können die Ergebnisse wissenschaftlich in einem Referat präsentieren und sich einer Diskussion stellen.

Inhalt:

- Theorie der komponentenbasierten Systementwicklung
- Fachkomponenten,
- Frameworks,
- Komponenten-Lebenszyklen,
- CoBCoM-Architektur
- Architekturen von Systemlandschaften
- Pattern-Sprachen und Architektur-Pattern
- Service-orientierte Architektur (SoA)
- Web-Services
- Mediatoren
- Fallstudien
- Personal Information
- GuideShared ERP Architecture
- Inhaltsverzeichnis Teil A (Winter) Seite 250 – Teil A Inhaltsverzeichnis Teil B (Gesamt)
- S4/Hana und SAP Datasphere
- Prototypische Realisierung eines interorganisationalen Informationssystems auf Grundlage der CoBCoM-Architektur und SoA

Arbeitsaufwand:

Präsenzzeiten:

28 h Vorlesung / 28 h Übung

Selbstständiges Arbeiten:

1. Vor- und Nachbereitung Vorlesung
2. Entwicklung einer auf maschinellem Lernen basierenden Lösung unter Anwendung von MLOps-Praktiken zur Lösung betriebswirtschaftlicher Probleme

9 x30h (56 h Präsenzzeit + 214 h selbstständige Arbeit)

Prüfungsvorleistungen:	Studien-/Prüfungsleistungen:	Lehrform / SWS:
	Referat	• Vorlesung (2 SWS) • Übung (2 SWS)

Voraussetzungen nach Prüfungsordnung:	Empfohlene Voraussetzungen:
Version control systems, DevOps practices (CI/CD), Containerization technologies, and python.	Version control systems, DevOps practices (CI/CD), Containerization technologies, and python.

Medienformen:	Literatur:
	• Turowski, K.: Fachkomponenten. Aachen 2002. • Herden, S., Marx Gómez, J., Rautenstrauch, C., Zwanziger, A.: Softwarearchitekturen für E-Business-Systeme, Berlin, Heidelberg u. a., 2006.

Hinweise:

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 accessibility:	true
Responsibility:	Prof. Dr. Klaus Turowski
Lecturer:	Prof. Dr. Klaus Turowski
Classes:	• '- Lecture <i>VLBA Cloud DevOps Technologies</i> ◦ Exercise <i>VLBA Cloud DevOps Technologies</i> ◦ Consultation <i>VLBA - Cloud DevOps Technologien (Consultation)</i> ◦ Tutorial <i>VLBA - Cloud DevOps Technologien (Tutorial)</i>
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 Independent 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
WIP

CP
6

Semester
jedes

Fachsem.
ab 1.

Dauer
1 Semester

Sprache
deutsch

Niveau
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.

Wissenschaftliches Teamprojekt

jedes

(engl. Scientific Team Project)

Modulnummer: FIN-INF-120482

Kürzel
WTP

CP
6

Semester
jedes

Fachsem.
ab 1.

Dauer
1 Semester

Sprache
deutsch

Niveau
Master

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

Verwendbarkeit:	- M.Sc. INF: Informatik - M.Sc. INF: Schlüssel- und Methodenkompetenzen - M.Sc. INF: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. INF: Projekte (SPO 2027) - M.Sc. INGINF: Informatik - M.Sc. INGINF: Ingenieurinformatik - M.Sc. INGINF: Schlüssel- und Methodenkompetenzen - M.Sc. WIF: Wirtschaftsinformatik - M.Sc. WIF: Informatik - M.Sc. WIF: Schlüssel- und Methodenkompetenzen - M.Sc. WIF: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. WIF: Projekte (SPO 2027) - M.Sc. DKE: Applied Data Science - M.Sc. DKE: Projects (SPO 2027) - M.Sc. DE: Interdisziplinäres Team-Projekt - M.Sc. DE: Digital Engineering-Projekt - M.Sc. DE: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. DE: Projekte (SPO 2027) - M.Sc. VC: Schlüssel- und Methodenkompetenzen - M.Sc. VC: Schlüssel- und Methodenkompetenz (SPO 2027) - M.Sc. VC: Projekte (SPO 2027)
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Angestrebte Lernergebnisse:

Nach Abschluss des Moduls können die Studierenden ...

- im Team eine komplexe Aufgabe aus dem Fachgebiet mit wissenschaftlichen Methoden bearbeiten
- Lösungsmöglichkeiten diskutieren und sich auf einen gemeinsamen Lösungsweg einigen, zu dem jeder seine Ideen einbringt,
- das benötigte Wissen erarbeiten und für das Team verfügbar machen
- mit anderen zusammen ein Projekt planen und lenken und für ihre eigene Rolle im Team die Verantwortung übernehmen
- das Team-Ergebnis präsentieren und beurteilen und ihre Entscheidungen verteidigen
- sich rückblickend mit der Ausübung ihrer Rolle im Team und ihrem Beitrag zum gemeinsamen Ergebnis auseinandersetzen

Inhalt:

Dieses Modul wird von unterschiedlichen Hochschullehrern implementiert. Die fachlichen Inhalte sind daher angebotsspezifisch.

Arbeitsaufwand:

180 h selbstständige Arbeit

Prüfungsvorleistungen:	Studien-/Prüfungsleistungen:	Lehrform / SWS:
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	Referat	Wissenschaftliches Projekt
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Voraussetzungen nach Prüfungsordnung:	Empfohlene Voraussetzungen:
keine	

Medienformen:	Literatur:

Hinweise:

Scientific Teamproject KMD

every

(in German: Wissenschaftliches Teamprojekt KMD)

Module-ID: FIN-INF-120528

Abbreviation Teamproj_KMD	Credit Points 6	Semester every	Term starting at 1.	Duration 1 Semester	Language english	Level Master
Link:	LSF					
Limited accessibility:	false					
Responsibility:	Myra Spiliopoulou					
Lecturer:	Myra Spiliopoulou					
Classes:	Teamproj_KMD					
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: Applied Data Science - M.Sc. DE: Interdisziplinäres Team-Projekt - M.Sc. DE: Fachliche Spezialisierung - M.Sc. DE: Digital Engineering-Projekt - M.Sc. VC: Computer Science - M.Sc. VC: Schlüssel- und Methodenkompetenzen					

Intended learning outcomes:

When completing this module successfully, the students can: * solve a realistic data mining and data engineering task in teamwork * assess the business implications (costs and benefits) of a solution they propose * built-up a team and organize themselves in it, distributing subtasks among themselves according to their competences, setting milestones and pursuing a joint schedule *

search for scientific papers of relevance * search appropriate libraries for data preparation, learning and visualization * design a learning workflow, apply AI methods and evaluate the induced models * develop a software solution jointly, using public domain tools * justify their design decisions and software suite selections * present their work as a team * write a joint report where they summarize and justify their approach

Bitte nachtragen nach neuen Constructive Alignment Vorgaben.

Content:

CONTENT: Assignment in the form of a realistic task that involves the analysis of static or dynamic, structured or unstructured data with mining methods, including supervised, unsupervised and semi-supervised methods, stream miners, forecasters and elaborate AI tools. The assignment involves design, development and evaluation of a software solution in teamwork. **STRUCTURE:** The assignment is for a team of students, typically three; for larger teams, the assignment is extended to ensure that the effort of each student is 6 ECTS. The students are called to solve the task as a team. The task involves understanding a realistic problem, designing, developing and evaluating a solution for it, presenting this solution to the class, defending it and documenting it on paper.

Workload:

For each team member: 28 h in class (including meetings) + 124 h self-study The teamproject is typically for three students. For larger teams, the assignments is extended to ensure that the effort of each team member is as above.

Pre-examination requirements:	Type of examination:	Teaching method / lecture hours per week (SWS):
	Wissenschaftliches Projekt, implementiert als eine Hausarbeit, die ein Referat beinhaltet COURTESY TRANSLATION: This module implements the exam form 'Wissenschaftliches Projekt' as a 'Hausarbeit' which incorporates a 'Referat'.	Wissenschaftliches Teamprojekt (2 SWS)
Prerequisites according to examination regulations:		Recommended prerequisites:

keine	• Familiarity with advanced mining methods for static data and (for some assignments) for streams • Familiarity with software development and software libraries • Underpinnings of project management
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Media:	Literature:
	Literature depends on topic assignment and is given to each team together with the assignment

Comments:

Als Implementierung des generischen **PFLICHTMODULS** "Wissenschaftliches Teamprojekt" entsprechend anrechenbar. **COURTESY TRANSLATION:** This module implements the **COMPULSORY** generic module 'Wissenschaftliches Teamprojekt'.