MODULE HANDBOOK

Master of Science

DevOps and Cloud Computing Managemen (FS-OI-EU-MADCC-60)

60 ECTS

Distance Learning

INTERNATIONAL
UNIVERSITY OF
APPLIED SCIENCES

Contents

1. Semester

Agile Project Management

Module Code: DLMIEEAPM

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	5	150 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
1. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Thomas Winkle (Agile Project Management)

Contributing Courses to Module

- Agile Project Management (DLMIEEAPM01)

Module Exam Type

Module Exam	Split Exam
Study Format: Distance Learning Written Assessment: Case Study	

Weight of Module

see curriculum

Module Contents

- Fundamentals of Agile Methods in Project Management
- Traditional and Agile Approaches to Project Management
- Agile Project Management with Scrum
- Agile Project Management with Kanban
- Implementing Agile within the Organization
- Expanding Agile across the Organization

Learning Outcomes

Agile Project Management

On successful completion, students will be able to

- understand the significance of agile methods to efficiently and effectively manage projects within and across organizations.
- compare the major characteristics of traditional and agile approaches to project management.
- apply the Scrum methodology as a main framework of agile project management.
- apply the Kanban methodology as a main framework of agile project management.
- implement agile value-driven strategies and effective agile product roadmaps into the organization.
- judge the scaling of agile practices across the entire organization.

Links to other Modules within the Study Program	Links to other Study Programs of the University
This module is similar to other modules in the field of Project Management	All Master Programs in the Business & Management field

Agile Project Management

Course Code: DLMIEEAPM01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Agile methods accelerate the development and delivery of a product or service by the division of tasks into short phases of work and frequent reassessment and adaptation of plans. While originally used for software programming, the agile methodology has become a widely used approach in many areas of business. When applied to project management situations, agile contributes to a more flexible planning, a faster determining of the requirements and a more effective executing of a project. The concept of agile is based on the Agile Manifesto which includes four key values and twelve main principles to guide an iterative and people-centric managing of projects. In this course, students are introduced to the agile project management framework with an emphasis on the product owner's role. They learn how to develop the product vision and the product roadmap, organize the project team, identify user roles, write user stories and establish an operant project risk management. This way, students shall also develop a mindset for the agile methodology. The course puts a special emphasis on the Scrum and Kanban framework as two main pillars to agilely manage projects within and across organizations.

Course Outcomes

On successful completion, students will be able to

- understand the significance of agile methods to efficiently and effectively manage projects within and across organizations.
- compare the major characteristics of traditional and agile approaches to project management.
- apply the Scrum methodology as a main framework of agile project management.
- apply the Kanban methodology as a main framework of agile project management.
- implement agile value-driven strategies and effective agile product roadmaps into the organization.
- judge the scaling of agile practices across the entire organization.

Contents

1. Fundamentals of Agile Methods in Project Management
   - 1.1 Definition and Significance of Agile Methods in Project Management
   - 1.2 The Agile Manifesto
   - 1.3 The Agile Values and Principles

2. Traditional and Agile Approaches to Project Management
   - 2.1 Traditional Approaches to Project Management
   - 2.2 Agile Approaches to Project Management
   - 2.3 Comparison of Traditional versus Agile Project Management

3. Agile Project Management with Scrum
   - 3.1 Scrum Values and Principles
   - 3.2 Scrum Roles, Events and Artifacts
   - 3.3 Application Areas of Scrum

4. Agile Project Management with Kanban
   - 4.1 Kanban Values and Principles
   - 4.2 Kanban Boards and Cards
   - 4.3 Application Areas of Kanban

5. Implementing Agile within the Organization
   - 5.1 Implementing Agile Value-driven Delivery Strategies
   - 5.2 Creating an Effective Agile Product Roadmap
   - 5.3 Coaching an Agile Team

6. Expanding Agile across the Organization
   - 6.1 Agile at Scale Practices across the Organization
   - 6.2 Agile Portfolio Management
   - 6.3 Scaled Agile Framework (SAFe)

Literature
Compulsory Reading
Further Reading ▪ Campell, A. (2021). Agile Guide: Perfect Guide to Agile Project Management for Successful Leader. Independently published. ▪ Goodpasture, J. (2015). Project Management the Agile Way: Making it Work in the Enterprise. 2nd edition, J. Ross Publishing, Plantation (Florida/USA). ▪ Hill, T. (2019). Agile Project Management: How to Skillfully Implement Scrum, Run Effective Teams, and Cultivate High-Performance Leadership. Independently published. ▪ Rigby, D.K., Sutherland, J. & Noble, A. (2018). Agile at Scale: How to go from a few teams to hundreds. Harvard Business Review. (URL: https://hbr.org/2018/05/agile-at-scale [last access: 15.03.2021]). ▪ Wysocki, R. K (2019). Effective Project Management: Traditional, Agile, Extreme. 7th edition, Wiley Publ., Indianapolis.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Case Study

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Written Assessment: Case Study

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
110 h	0 h	20 h	20 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☑ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☐ Exam Template	☑ Slides

DevOps

Module Code: DLMDCCDO

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	BA	5	150 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
1. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Christian Winkler (DevOps)

Contributing Courses to Module

- DevOps (DLMDCCDO01)

Module Exam Type

Module Exam	Split Exam
Study Format: Distance Learning Case Study	

Weight of Module

see curriculum

Module Contents

- Building and Testing
- Releases and Deployment
- Security and Maintenance
- Monitoring and Logging

Learning Outcomes

DevOps

On successful completion, students will be able to

- define DevOps and related disciplines.
- plan the building and testing process for software.
- perform software releases and deployments.
- implement the security of applications.
- understand the need for monitoring and logging.

Links to other Modules within the Study Program	**Links to other Study Programs of the University**
This module is similar to other modules in the field of Computer Science & Software Development	All Master Programs in the IT & Technology field(s)

DevOps

Course Code: DLMDCCDO01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
BA	English		5	none

Course Description

Software development and software maintenance used to be two different disciplines. Due to the growing complexity, interfaces, and interactions between the components, these have been combined in DevOps. DevOps engineers have a profound knowledge of software development and know how to operate the software. This course reflects the full spectrum of software DevOps starting from requirements, detailing build processes and collaboration, taking a deeper look into testing and deployment, focusing on software security until eventually finishing with monitoring and logging to ensure solid operations

Course Outcomes

On successful completion, students will be able to

- define DevOps and related disciplines.
- plan the building and testing process for software.
- perform software releases and deployments.
- implement the security of applications.
- understand the need for monitoring and logging.

Contents

1. Introduction to Devops
   - 1.1 Term Definition
   - 1.2 Historical Development
   - 1.3 Software Getting More Complex
   - 1.4 Challenges in Deployment And Operations
   - 1.5 Security
2. Building Software
   - 2.1 Requirements
   - 2.2 Co-Development in Teams
   - 2.3 Configuration Management with Git
   - 2.4 Solving Conflicts
   - 2.5 Continuous Builds

3. Testing Software
   - 3.1 Module Tests
   - 3.2 Integration Tests
   - 3.3 Measuring Coverage
   - 3.4 Test Automation
   - 3.5 Integrating Tests in Continuous Build

4. Software Releases And Deployments
   - 4.1 Working with The Trunk
   - 4.2 Working With Branches and Adding Features
   - 4.3 Planning AaRelease
   - 4.4 Manual Deployment
   - 4.5 Automatic Deployment

5. Software Security
   - 5.1 Importance of Security
   - 5.2 Types of Security
   - 5.3 Security Testing
   - 5.4 Detecting Security Incidents
   - 5.5 Reacting to Security Incidents

6. Monitoring and Logging
   - 6.1 Definition Monitoring
   - 6.2 Definition Logging
   - 6.3 Aggregating Information
   - 6.4 Extracting Kpis
   - 6.5 Management Systems (Like Nagios)

Literature
Compulsory Reading
Further Reading ▪ Farcic, V. (2016). The DevOps 2.0 Toolkit. Packt Publishing. ▪ Forsgren, N., Kim, G., & Humble, J. (2018). Accelerate: the Science behind DevOps: building and scaling high performing technology organizations (First edition). IT Revolution Press. ▪ Gift, N., Behrman, K., Deza, A., & Gheorghiu, G. (2019). Python for DevOps: learn ruthlessly effective automation (First edition). O'Reilly. ▪ Kim, G., Willis, J., Debois, P., Allspaw, J., & Humble, J. (2016). The DevOps handbook: how to create world-class agility, reliability, and security in technology organizations (First edition). IT Revolution Press.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Case Study

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
110 h	0 h	20 h	20 h	0 h	150 h

Instructional Methods		
☐ Learning Sprints®	☐ Review Book	☐ Sprint
☐ Course Book	☐ Creative Lab	☐ Interactive Online Lecture
☐ Vodcast	☑ Guideline	
☑ Shortcast	☐ Live Tutorium/Course Feed	
☐ Audio	☑ Reader	
☐ Exam Template	☑ Slides	

Introduction to Cloud Computing and Serverless Computing

Module Code: DLMWIWCC1_E

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	5	150 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
1. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Andrew Adjah Sai (Introduction to Cloud Computing and Serverless Computing)

Contributing Courses to Module

- Introduction to Cloud Computing and Serverless Computing (DLMWIWCC01_E)

Module Exam Type

Module Exam	Split Exam
Study Format: Distance Learning Exam, 90 Minutes	

Weight of Module

see curriculum

Module Contents

- Cloud Computing Basics
- Service and Deployment Models for Cloud Computing
- Security and Privacy in the Cloud
- Cloud Computing Provider
- Typical Business Applications in the Cloud

Learning Outcomes

Introduction to Cloud Computing and Serverless Computing

On successful completion, students will be able to

- know and understand definitions and categorizations of cloud computing,
- describe the underlying technologies that enable cloud computing,
- explain and evaluate service models of the cloud,
- understand and assess security risks of cloud solutions for enterprises,
- differentiate between cloud providers on the market and compare their services,
- evaluate business applications in the cloud.

Links to other Modules within the Study Program	**Links to other Study Programs of the University**
This module is similar to other modules in the field of Computer Science & Software Development	All Master Programs in the IT & Technology field

Introduction to Cloud Computing and Serverless Computing

Course Code: DLMWIWCC01_E

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Cloud computing stands for technical services, software products and infrastructures that can be called up at any time and are provided decentrally via the Internet. They cover the increasing requirements of the digital corporate world with scalable and flexible solutions. The aim of this course is therefore to teach basic concepts as well as service and deployment models of cloud computing. The course enables students to identify and evaluate suitable use cases in the business world for cloud solutions. The course first reviews basic cloud computing terminology and classifications. Then it describes necessary technology that have made cloud computing possible. Afterwards, opportunities and risks of using cloud solutions are reflected and evaluated. Based on this, typical cloud service models are discussed and essential security concepts for cloud solutions are presented. After an overview of central players in the cloud market, typical use cases in the business world are shown. Additionally to the technical aspects, this course also provides a basic understanding of the use and usability of cloud solutions in the business environment.

Course Outcomes

On successful completion, students will be able to

- know and understand definitions and categorizations of cloud computing,
- describe the underlying technologies that enable cloud computing,
- explain and evaluate service models of the cloud,
- understand and assess security risks of cloud solutions for enterprises,
- differentiate between cloud providers on the market and compare their services,
- evaluate business applications in the cloud.

Contents

1. Cloud Technologies Basics
   - 1.1 Definition and Categories of Cloud Computing
   - 1.2 History and Evolution of Cloud Computing and its Technology
   - 1.3 Distinguishing Cloud Computing from related Concepts (Grid Computing, ASP, etc.)
   - 1.4 Opportunities and Risks of using Cloud Computing

2. Technologies enabling Cloud Computing
   - 2.1 Internet/Web 2.0
   - 2.2 Data Center
   - 2.3 Virtualization
   - 2.4 Containerization

3. Service Models in the Cloud
   - 3.1 Infrastructure as a Service (IaaS)
   - 3.2 Platform as a Service (PaaS)
   - 3.3 Software as a Service (SaaS)
   - 3.4 Function as a Service (FaaS).

4. Operation Models for Cloud Computing
   - 4.1 Public Cloud
   - 4.2 Private Cloud
   - 4.3 Community Cloud
   - 4.4 Hybrid Cloud

5. Cloud Security and Privacy
   - 5.1 Typical Security Risks of Applications, Interfaces and Data
   - 5.2 Best Practices for Cloud Encryption and Security Architecture
   - 5.3 Aspects of Data Protection

6. Cloud Provider
   - 6.1 Overview of the Global Market of Cloud Providers
   - 6.2 Provider Example of the "Big-4" (AWS, IBM, Google and Microsoft)

7. Business Use Cases and Application Examples
   - 7.1 Business Drivers for Cloud Computing
   - 7.2 Typical Application Examples (Data Analytics, ERP Solutions, IOT, Blockchain, and others)

Literature
Compulsory Reading
Further Reading ▪ Bahga, A.; Madisetti, V. (2019): Cloud Computing Solutions Architect: A Hands-On Approach; VPT ▪ Chang, V./Walters, R.J./Wills, G. (2015): Delivery and Adoption of Cloud Computing Services in Contemporary Organizations. IGI Global, Hershey PA. ▪ Erl, T.; Cope, R.; Naserpour, A. (2015): Cloud Computing Design Patterns, Prentice Hall ▪ Kavis, M.J. (2014): Architecting the Cloud: Design Decisions for Cloud Computing Service Models, Wiley ▪ Longbottom, C. (2017): Evolution of Cloud Computing – How to Plan for Change. BCS The Chartered Institute for IT, Swindon UK. ▪ Lynn, T.; Mooney, J.G.; van dre Werff, L.; Fox, G. (2021): Data Privacy and Trust in Cloud Computing, Palgrave Macmillan, Cham ▪ Patnaik, S.; Yang, Y.; Tavana, M.; Popentiu-Vlădicescu, F.; Qiao, F. (2019) Digital Business, Springer, Cham ▪ Ramachandran, M. (2016): Software security requirements management as an emerging cloud computing service. In: International Journal of Information Management, 36 (4), S. 580–590. ▪ Surianarayanan, C.; Chelliah P.R. (2019): Essentials of Cloud Computing, Springer, Cham ▪ Vacca, J. R. (2017): Cloud computing security: foundations and challenges. CRC Press, Boca Raton.

Study Format Distance Learning

Study Format	**Course Type**
Distance Learning	Online Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☐ Guideline
☑ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☑ Exam Template	☑ Slides

Seminar: Strategic Analysis

Module Code: DLMIMSSA_E

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	5	150 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
1. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Birgit Baum (Seminar: Strategic Analysis)

Contributing Courses to Module

- Seminar: Strategic Analysis (DLMIMSSA01_E)

Module Exam Type

Module Exam	Split Exam
Study Format: Distance Learning Written Assessment: Research Essay	

Weight of Module

see curriculum

Module Contents

In the seminar "Strategic Analysis", students gain an insight into the topic of IT strategy by independently working on a selected specialist topic. Based on current issues from the business world, such as digitalization, platform solutions or M&A, existing IT strategies are evaluated and aspects for a new target IT strategy are developed.

Learning Outcomes

Seminar: Strategic Analysis

On successful completion, students will be able to

- know and apply methods to evaluate an existing IT strategy.
- transfer aspects of corporate strategy to strategic IT management.
- define operational IT goals and ensure their measurability.
- develop frameworks for an IT work culture and apply them to recruitment and development of IT employees.
- make recommendations for the establishment of IT processes, IT services and IT project management methods.
- identify legal frameworks and recommend measures for their compliance.
- develop a maturity model for the continuous assessment of IT management.

Links to other Modules within the Study Program	**Links to other Study Programs of the University**
This module is similar to other modules in the fields of Business Administration & Management	All Master Programs in the Business & Management fields

Seminar: Strategic Analysis

Course Code: DLMIMSSA01_E

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

As part of the "Strategic Analysis" seminar, students prepare a research essay on a specialist topic. With regard to current issues from the business world, such as digitalization, platform solutions and M&A, existing IT strategies are evaluated and aspects for new target IT strategies are developed. This may involve internal company changes or a focus on a specific industry or on medium-sized companies. In this way, students demonstrate that they can independently familiarize themselves with a current and relevant topic and document the findings in a structured manner.

Course Outcomes

On successful completion, students will be able to

- know and apply methods to evaluate an existing IT strategy.
- transfer aspects of corporate strategy to strategic IT management.
- define operational IT goals and ensure their measurability.
- develop frameworks for an IT work culture and apply them to recruitment and development of IT employees.
- make recommendations for the establishment of IT processes, IT services and IT project management methods.
- identify legal frameworks and recommend measures for their compliance.
- develop a maturity model for the continuous assessment of IT management.

Contents

- The seminar deals with current corporate strategic changes and their influence on IT strategy. In particular, the changes due to digitalization, the development of platform solutions or M&A will be addressed. The effects are analyzed and reflected upon for companies in specific industries, for partial aspects of IT strategy or for medium-sized companies. For this purpose, each participant prepares a research essay with a scientific claim on a topic that can be selected from three possible topics.

Literature

Compulsory Reading

Further Reading

- Bones, C., & Hammersley, J. (2015). Leading Digital Strategy: Driving Business Growth Through Effective E-commerce. Kogan Page London.
- Drechsler, A., & Weißschädel, S. (2017). An IT strategy development framework for small and medium enterprises. Springer-Verlag Berlin Heidelberg.
- Gupta, S. (2018). Driving Digital Strategy: A Guide to Reimaging Your Business. Harvard Business Review Press.
- High, P. A. (2014). Implementing World Class IT Strategy: How IT Can Drive Organizational Innovation. John Wiley & Sons, Inc., ProQuest Ebook Central.
- Korachi, Z., & Bounabat, B. (2022). IT Management and Governance Framework for Formulating a Digital Transformation Strategy, in: Advanced Intelligent Systems for Sustainable Development (AI2SD'2020): Volume 2. 1418:475-498, Cham: Springer International Publishing.
- Manfreda, A., & Stemberger, M. I. (2018). Establishing a partnership between top and IT managers: A necessity in an era of digital transformation. Information Technology & People, Vol. 32 No. 4, pp. 948-972, Emerald Publishing Ltd, 0959-3845.
- McKeen, J., & Smith, H. (2015). IT Strategy: Issues and Practices. Global Edition, Pearson Education, ProQuest Ebook Central, 3rd ed.
- Strategic Direction (2022). How modern technologies can generate a competitive edge. A framework for success. Vol. 38 No. 1, pp. 4-6., Emerald Publishing Limited.
- Westerman, G., & Bonnet, D./McAFee, A. (2014). Leading Digital. Turning Technology Into Business Transformation. Harvard Business Review Press.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Seminar

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Research Essay

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods		
☐ Learning Sprints®	☐ Review Book	☐ Sprint
☐ Course Book	☐ Creative Lab	☐ Interactive Online Lecture
☐ Vodcast	☑ Guideline	
☐ Shortcast	☐ Live Tutorium/Course Feed	
☐ Audio	☐ Reader	
☐ Exam Template	☑ Slides	

Business Communication and Storytelling

Module Code: DLMCOBCST_E

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	5	150 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
1. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Caterina Fox (Business Communication and Storytelling)

Contributing Courses to Module

- Business Communication and Storytelling (DLMCOBCST01_E)

Module Exam Type

Module Exam	Split Exam
Study Format: Distance Learning Concept Presentation	

Weight of Module

see curriculum

Module Contents

The module will enable students to present information in an audience-centered way and to create "stories" out of numbers and data. This competence plays a significant role in an increasingly data-based world and helps to make numbers and data come alive and tangible and thus create a stronger impact internally and externally.

Learning Outcomes

Business Communication and Storytelling

On successful completion, students will be able to

- bring data to life through storytelling.
- apply storytelling methods to their own data.
- link emotions to data.
- build a presentation based on dramaturgy.
- use presentation techniques to reinforce the story.
- visualize data in an audience-centered way.

Links to other Modules within the Study Program	**Links to other Study Programs of the University**
This module is similar to other modules in the field of Business & Management	All Master Programs in the Business Administration & Management field

Business Communication and Storytelling

Course Code: DLMCOBCST01_E

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Never before has so much data been collected constantly and everywhere as today. On the one hand, data creates a basis for precise analysis - on the other hand, the flood of data also leads to confusion and excessive demands. Particularly in controlling, a lot of effort is put into compiling figures month after month to create analyses and forecasts and make data-driven decisions. The goal is to process data in an appealing way and to present it convincingly. This is where controllers often reach their limits, because at this point, they frequently encounter audiences who are under strong time pressure (management level), who do not have an affinity for numbers (customers) or to whom figures and plans have to be "sold" in such a way that they are willing to provide financing (banks and investors). This is where storytelling comes in handy as a method that helps to package figures and data in a story, to bring complex issues to the point and to provide them with suspense and emotions.Stories, metaphors, and the associated emotions not only focus attention, but also increase recall. They can enhance decisions by increasing persuasiveness, credibility, and trust.

Course Outcomes

On successful completion, students will be able to

- bring data to life through storytelling.
- apply storytelling methods to their own data.
- link emotions to data.
- build a presentation based on dramaturgy.
- use presentation techniques to reinforce the story.
- visualize data in an audience-centered way.

Contents

- The course covers the role of the storyteller in companies today, for executives and managers, for controllers and marketers. At the same time, aspects of creating meaning for internal and external communication through storytelling are developed. In the course, students focus on three key aspects: First, they develop instruments, methods, and concepts of storytelling and apply them. This includes the central building blocks of a story, the benefits and added value of storytelling, and fundamentals and concepts of data-based storytelling. Secondly, the students deal with options for creative visualization and design principles of data and apply these visualization techniques. The visualization approach depends on the audience and how well it supports the storyline. This includes creative

graphics for presentations, as well as effective and self-explanatory dashboard design. Third, students develop techniques and stylistic devices that authentically convey emotions and thus support the story, without appearing contrived. The learned content will be bundled and presented in a concept presentation.

Literature

Compulsory Reading

Further Reading

- Chapple, D., Pollock, N., & D'Adderio, L. (2022). From Pitching to Briefing: Extending Entrepreneurial Storytelling to New Audiences. Organization Studies, 43(5), 773–795. https://doi-org.pxz.iubh.de:8443/10.1177/01708406211024564
- Dykes, B. (2020). Effective Data Storytelling : How to Drive Change With Data, Narrative and Visuals. Wiley.
- Ikhsan, R. B., Muhammad, N. G., Faishal, M. R., Sutanto, W., Fernando, Y., & Susilo, A. (2022). Digital Storytelling and Intention to Donate Through Crowdfunding Platform. 2022 7th International Conference on Business and Industrial Research (ICBIR), Business and Industrial Research (ICBIR), 2022 7th International Conference On, 116–121. https://doi-org.pxz.iubh.de:8443/10.1109/ICBIR54589.2022.9786491
- Nussbaumer Knaflic, C. (2020). Data Storytelling - A New Trend to Improve Your Reporting. Rethinking Finance, 6, 60–65.
- Nussbaumer Knaflic, C. (2015). Storytelling With Data: A Data Visualization Guide for Business Professionals. Wiley.
- Roam, D. (2022). Tell More and Better Stories! People Grow Through Visual Storytelling (Including You). HR Future, 1, 20–23.
- Sakamoto, Y., Sallam, S., Salo, A., Leboe-McGowan, J., & Irani, P. (2022). Persuasive Data Storytelling With a Data Video During Covid-19 Infodemic: Affective Pathway to Influence the Users' Perception About Contact Tracing Apps in Less Than 6 Minutes. 2022 IEEE 15th Pacific Visualization Symposium (PacificVis), Pacific Visualization Symposium (PacificVis), 2022 IEEE 15th, PACIFICVIS, 176–180. https://doi-org.pxz.iubh.de:8443/10.1109/PacificVis53943.2022.00028
- Storr, W. & Clamp, J. (2020). The Science of Storytelling. Dreamscape Media, LLC.
- Vora, S. (2020). The Power of Data Storytelling. Sage.
- Wexler, S., Shaffer, J., & Cotgreave, A. (2017). The Big Book of Dashboards. Wiley.

Study Format Distance Learning

Study Format	**Course Type**
Distance Learning	Project

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Concept Presentation

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods		
☐ Learning Sprints®	☐ Review Book	☐ Sprint
☐ Course Book	☐ Creative Lab	☐ Interactive Online Lecture
☐ Vodcast	☑ Guideline	
☐ Shortcast	☐ Live Tutorium/Course Feed	
☐ Audio	☐ Reader	
☐ Exam Template	☑ Slides	

DLMCOBCST01_E

Applied Research

Module Code: DLMAF_E

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	None	MA	5	150 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
1. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Julia Pitters (Applied Research)

Contributing Courses to Module

- Applied Research (DLMAF01_E)

Module Exam Type

Module Exam	Split Exam
Study Format: Distance Learning Written Assessment: Written Assignment	

Weight of Module

see curriculum

Module Contents

- Fundamentals of Empirical Research
- The Empirical Research Process
- Qualitative Survey Research
- Standardized Survey Research
- Experimental Research
- Specifics of Research with Secondary and Observational Data

Learning Outcomes

Applied Research

On successful completion, students will be able to

- evaluate the type and quality of empirical research and of concrete empirical research results based on relevant criteria.
- identify appropriate data and research methods to empirically address a specific problem or research question.
- name and critically compare the process steps as well as the potentials, aims and limitations of different quantitative and qualitative research methods.
- recognize and consider basic ethical and legal aspects while conducting empirical research.
- design an empirical and theory-based study on their own to adequately address a specific applied research problem.

Links to other Modules within the Study Program	**Links to other Study Programs of the University**
This module is similar to other modules in the field of Methods	All Master Programs in the field of Business & Management

Applied Research

Course Code: DLMAF01_E

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	None

Course Description

The course teaches central concepts and methods of applied empirical research. The students acquire profound knowledge to evaluate the quality as well as the limitations of different empirical research approaches. First, students learn the central theoretical foundations of empirical research and the central process steps of empirical research projects. In doing so, students are also sensitised to the ethical and legal challenges. The course deals in depth with the application of central qualitative and quantitative research methods, for each of which the central goals and decision areas, their strengths, and weaknesses, as well as practical recommendations for application are discussed. The course enables students to develop an empirical study for an applied problem in their field or professional environment and to critically evaluate the quality of empirical findings as well as their validity.

Course Outcomes

On successful completion, students will be able to

- evaluate the type and quality of empirical research and of concrete empirical research results based on relevant criteria.
- identify appropriate data and research methods to empirically address a specific problem or research question.
- name and critically compare the process steps as well as the potentials, aims and limitations of different quantitative and qualitative research methods.
- recognize and consider basic ethical and legal aspects while conducting empirical research.
- design an empirical and theory-based study on their own to adequately address a specific applied research problem.

Contents

1. Fundamentals of Empirical Research
   - 1.1 Aims and Basic Approaches of Empirical Research
   - 1.2 Objectivity, Reliability, and Validity of Empirical Research
   - 1.3 Causality

2. The Empirical Research Process
   - 2.1 Determination of the Research Objective
   - 2.2 Choice of Research Design
   - 2.3 Data Collection and Data Analysis
   - 2.4 Interpretation and Presentation of Results
   - 2.5 Ethical and Legal Aspects of Empirical Research

3. Qualitative Survey Research
   - 3.1 Fundamentals, Goals and Process Steps
   - 3.2 Central Forms of Data Collection
   - 3.3 Methods to Analyse Qualitative Data
   - 3.4 Quality Assessment

4. Standardized Survey Research
   - 4.1 Fundamentals, Goals and Process Steps
   - 4.2 Central Forms of Data Collection
   - 4.3 Questionnaire Design, Measurement and Operationalization
   - 4.4 Sampling and Sample Evaluation
   - 4.5 Quality Assessment

5. Experimental Research
   - 5.1 Fundamentals, Goals and Process Steps
   - 5.2 Types of Experiments and Experimental Designs
   - 5.3 Measurement and Manipulation of Variables
   - 5.4 Key Implementation Challenges
   - 5.5 Quality Assessment

6. Specifics of Research with Secondary and Observational Data
   - 6.1 Fundamentals, Goals and Specifics
   - 6.2 Selected Approaches to Analyse Secondary Data
   - 6.3 Selected Approaches to Analyse Observational Data

Literature
Compulsory Reading
Further Reading ▪ Flick, U. (2018). An Introduction to Qualitative Research (6th edition). Sage. ▪ Gravetter, F. J., & Forzano, L. A. B. (2018). Research Methods for the Behavioral Sciences (6th edition. Cengage Learning. ▪ Quinlan, C., Babin, B., Carr, J. Griffin, M., & Zikmund, W. G. (2019). Business Research Methods (2nd edition). Cengage Learning. ▪ Vomberg, A., & Klarmann, M. (2021). Crafting Survey Research: A Systematic Process for Conducting Survey Research. In C. Homburg, M. Klarmann, & A. E. (Eds.), Handbook of market research (pp. 1-53). Springer.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Online Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Written Assessment: Written Assignment

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
110 h	0 h	20 h	20 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☑ Shortcast	☑ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☐ Exam Template	☑ Slides

2. Semester

Seminar: Computer Science and Society

Module Code: DLMCSSCSAS

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	None	MA	5	150 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. André Köhler (Seminar: Computer Science and Society)

Contributing Courses to Module

- Seminar: Computer Science and Society (DLMCSSCSAS01)

Module Exam Type

Module Exam	Split Exam
Study Format: Distance Learning Written Assessment: Research Essay Study Format: myStudies Written Assessment: Research Essay	

Weight of Module

see curriculum

Module Contents

- The seminar covers the relationship between computer science and society, including topics such as the social responsibility of computer scientists and the effects of digitization on society. Based on a list of topics updated regularly, students select or are assigned a specific topic on which to write a scientific report.

Learning Outcomes

Seminar: Computer Science and Society

On successful completion, students will be able to

- name the main questions regarding the relationship between computer science and society.
- discuss selected topics regarding the relationship between computer science and society.
- analyze one aspect of the relationship between computer science and society in detail.
- take selected topics and case studies and link them with well-known concepts, as well as critically question and discuss them.
- transfer theoretically acquired knowledge to a specific context.
- edit scientifically a select topic.

Links to other Modules within the Study Program	**Links to other Study Programs of the University**
This module is similar to other modules in the field of Computer Science & Software Development.	All Master Programmes in the IT & Technology field.

Seminar: Computer Science and Society

Course Code: DLMCSSCSAS01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	None

Course Description

The seminar covers the relationship between computer science and society. Over the past several decades, computer science has greatly changed society, and it is important that prospective computer scientists think about the effects of computer science on society and take these influences into account in their work. Typical topics to be addressed include, for example, the effects of ethics and professionalism in computing, the responsibility of computer scientists, the effects of data science and social networks on society, surveillance, and dual use of IT.

Course Outcomes

On successful completion, students will be able to

- name the main questions regarding the relationship between computer science and society.
- discuss selected topics regarding the relationship between computer science and society.
- analyze one aspect of the relationship between computer science and society in detail.
- take selected topics and case studies and link them with well-known concepts, as well as critically question and discuss them.
- transfer theoretically acquired knowledge to a specific context.
- edit scientifically a select topic.

Contents

- The seminar covers different topics regarding the relationship between computer science and society. Each participant must create a seminar paper on a topic assigned to him/her and present the contents of the written paper.

Literature

Compulsory Reading

Further Reading

- Turabian, K. L. (2013). A manual for writers of research papers, theses, and dissertations. Chicago: University of Chicago Press.
- Swales, J. M., & Feak, C. R. (2012). Academic writing for graduate students, essential tasks and skills. Michigan: University of Michigan Press.
- Bailey, S. (2011). Academic writing for international students of business. New York, NY: Routledge

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Seminar

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Research Essay

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

Study Format myStudies

Study Format	Course Type
myStudies	Seminar

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Research Essay

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

Applied Container Orchestration

Module Code: DLMDCCEACO

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	10	300 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Christian Winkler (Container Orchestration) / Prof. Dr. Christian Winkler (Project: Container Orchestration)

Contributing Courses to Module

- Container Orchestration (DLMDCCCO01)
- Project: Container Orchestration (DLMDCCPCO01)

Module Exam Type

Module Exam	Split Exam
	Container Orchestration • Study Format "Distance Learning": Exam or Written Assessment: Case Study, 90 Minutes Project: Container Orchestration • Study Format "Distance Learning": Written Assessment: Project Report

Weight of Module

see curriculum

Module Contents

Container Orchestration

- Introduction to Containers
- Container Composition And Services
- Container Registries
- Container Orchestration
- Kubernetes
- Orchestration in Production

Project: Container Orchestration

Containers will be introduced with docker and used in more complex scenarios with docker-compose. Afterwards, container registries will be shown and lead to container orchestration. The most popular software for this orchestration is Kubernetes, which will be implemented to build a production setup.

Learning Outcomes

Container Orchestration

On successful completion, students will be able to

Project: Container Orchestration

On successful completion, students will be able to

- transfer acquired theoretical knowledge to real-world case studies.
- apply the concepts covered in the preceding container orchestration course to build a running system.
- explain the design choices made in the selection of the deployed components and its implementation.
- translate the learned theories into the practice of orchestration.
- critically evaluate the resulting system's performance.

Links to other Modules within the Study Program	Links to other Study Programs of the University
This module is similar to other modules in the field of Computer Science & Software Development	All Master Programs in the IT & Technology field(s)

Container Orchestration

Kurscode: DLMDCCCO01

Niveau	Kurs- und Prüfungssprache	SWS	ECTS	Zugangsvoraussetzungen
MA	Deutsch		5	keine

Beschreibung des Kurses

Containers have become very popular in the last ten years. In many scenarios, they have completely replaced the software installation as it is much simpler, avoids dependencies and leads to much fewer issues for the software supplier. At the same time, service-oriented architectures have grown. Often, each container provides just one service of a whole service bouquet. As the services depend on each other, they must be orchestrated, which happens on container level. The standard for container orchestration is the open-source software Kubernetes, which was originally created by Google.

Kursziele

On successful completion, students will be able to

Kursinhalt

1. Introduction to Containers
   - 1.1 Software Installation Before Containers
   - 1.2 Need For a Standard Environment
   - 1.3 Containers vs. Virtual Machines
   - 1.4 Container Images

2. Container Composition and Services
   - 2.1 Service-Oriented Architectures
   - 2.2 Separation of Concerns
   - 2.3 Communication Between Containers
   - 2.4 Software-Defined Network
   - 2.5 Example with Docker-Compose

Literatur
Pflichtliteratur
Weiterführende Literatur ▪ Dobies, J. & Wood, J. (2020). Kubernetes Operators: Automating the Container Orchestration Platform. O'Reilly. ▪ Saito, H., Lee, H-C. C. & Hsu, K-J. C. (2018). Kubernetes Cookbook: Practical Solutions to Container Orchestration (2nd ed.). Packt Publishing ▪ Sayfan, G. (2018) Mastering Kubernetes: Level up Your Container Orchestration Skills with Kubernetes to Build, Run, Secure, and Observe Large-Scale Distributed Apps (3rd ed.). Packt Publishing ▪ Schenker, G. N. (2020). Learn Docker - Fundamentals of Docker 19. x: Build, Test, Ship, and Run Containers with Docker and Kubernetes. (2nd ed.). Packt Publishing

Studienformat Distance Learning

Studienform	**Kursart**
Distance Learning	Online Lecture

Informationen zur Prüfung	
Prüfungszulassungsvoraussetzungen	**BOLK:** Nein **Evaluation:** Nein
Prüfungsleistung	Exam or Written Assessment: Case Study, 90 Minuten

Zeitaufwand Studierende					
Selbststudium	**Präsenzstudium**	**Tutorium**	**Selbstüberprüfung**	**Praxisanteil**	**Gesamt**
100 h	0 h	25 h	25 h	0 h	150 h

Lehrmethoden		
☐ Learning Sprints®	☐ Repetitorium	☐ Sprint
☑ Skript	☐ Creative Lab	☐ Interaktive Lehrveranstaltung
☐ Vodcast	☑ Prüfungsleitfaden	
☑ Shortcast	☑ Live Tutorium/Course Feed	
☑ Audio	☐ Reader	
☐ Musterklausur	☑ Folien	

Project: Container Orchestration

Course Code: DLMDCCPCO01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Containers have become very popular and are used on many deployment scenarios. This course works by giving hand-on examples of how this technology can be used. Running simple containers is not difficult. Using a service-oriented approach, many more containers will be necessary which have to be orchestrated. There are several strategies available for coping with these dependencies. Several standard software will be used and evaluated.

Course Outcomes

On successful completion, students will be able to

- transfer acquired theoretical knowledge to real-world case studies.
- apply the concepts covered in the preceding container orchestration course to build a running system.
- explain the design choices made in the selection of the deployed components and its implementation.
- translate the learned theories into the practice of orchestration.
- critically evaluate the resulting system's performance.

Contents

- Containers will be introduced for the different operating systems (Linux, Windows, MacOS). A first container will be built and run; updates will be performed to the container image. More complex scenarios require container composition. This will be introduced using docker-compose and a software-defined network. Using containers on different computers is much easier with container registries – these can be public or private. Container orchestration has different aspects like overlay networks and storage mapping which will be explored with docker swarm and later with Kubernetes. Kubernetes works with pods and has extensive configuration options which will all be explored. Additionally, a deployment scenario to a production environment will be shown including service exposition, monitoring, and logging.

Literature
Compulsory Reading
Further Reading ▪ Saito, H., Lee, H-C. C. & Hsu, K-J. C. (2018). Kubernetes Cookbook: Practical Solutions to Container Orchestration. (2nd ed.) Packt Publishing ▪ Sayfan, G. (2020) Mastering Kubernetes: Level up Your Container Orchestration Skills with Kubernetes to Build, Run, Secure, and Observe Large-Scale Distributed Apps. (3rd ed.). Packt Publishing ▪ Schenker, G. N. (2020). Learn Docker - Fundamentals of Docker 19. x: Build, Test, Ship, and Run Containers with Docker and Kubernetes. (2nd ed.). Packt Publishing ▪ Docker Documentation. (2022). https://docs.docker.com/. ▪ Kubernetes Documentation. (2022). https://kubernetes.io/docs/home/.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Project

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Project Report

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods		
☐ Learning Sprints®	☐ Review Book	☐ Sprint
☐ Course Book	☐ Creative Lab	☐ Interactive Online Lecture
☐ Vodcast	☑ Guideline	
☐ Shortcast	☑ Live Tutorium/Course Feed	
☐ Audio	☐ Reader	
☐ Exam Template	☑ Slides	

DLMDCCPCO01

Continuous and Lifecycle Security

Module Code: DLMCSEECLS_E

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	10	300 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Alexander Lawall (Cyber Resilience) / Prof. Dr. Alexander Lawall (Seminar: Applying Threat Intelligence)

Contributing Courses to Module

- Cyber Resilience (DLMCSEECLS01_E)
- Seminar: Applying Threat Intelligence (DLMCSEECLS02_E)

Module Exam Type

Module Exam	Split Exam
	Cyber Resilience • Study Format "Distance Learning": Exam, 90 Minutes Seminar: Applying Threat Intelligence • Study Format "Distance Learning": Written Assessment: Research Essay

Weight of Module

see curriculum

Module Contents

Cyber Resilience

- Cyber resilience
- DevSecOps
- Threat Intelligence
- Crisis Management
- Security Culture

Seminar: Applying Threat Intelligence

- Cyber resilience
- DevSecOps
- Threat Intelligence
- Crisis Management
- Security Culture

Learning Outcomes

Cyber Resilience

On successful completion, students will be able to

- implement defense in depth and fault tolerance.
- work with resilience frameworks.
- use threat intelligence to design better resilience.
- use DevSecOps practices to improve resilience.
- manage crises that arise from attacks and corporate culture.

Seminar: Applying Threat Intelligence

On successful completion, students will be able to

- understand weaknesses in an organization's defenses.
- make recommendations on how to make the organization more resilient.
- utilize threat intelligence for secure application and systems design.

Links to other Modules within the Study Program	Links to other Study Programs of the University
This module is similar to other modules in the fields of Computer Science & Software Development	All Master Programs in the IT & Technology fields

Cyber Resilience

Course Code: DLMCSEECLS01_E

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Even with state-of-the-art security controls in place, attacks will still be successful with enough persistence, and state actors and some criminals have shown a willingness to go that extra mile to penetrate their target. A resilient organization will have the monitoring and procedures in place and rapidly detect, triage and react to any attack. Furthermore, this organization will have enough fault tolerance so that an attack cannot affect the entire organization at the same time.

Course Outcomes

On successful completion, students will be able to

- implement defense in depth and fault tolerance.
- work with resilience frameworks.
- use threat intelligence to design better resilience.
- use DevSecOps practices to improve resilience.
- manage crises that arise from attacks and corporate culture.

Contents

1. Defense in depth
   - 1.1 The fallacy of complete security
   - 1.2 Byzantine fault tolerance
   - 1.3 Intrusion and fault detection
   - 1.4 Layers of protection
2. Design Principles
   - 2.1 Least Privilege
   - 2.2 Role and domain separation
   - 2.3 Revocation and Rollback
   - 2.4 Towards an anti-fragile organization
3. Fault tolerance
   - 3.1 Data protection and lifecycle
   - 3.2 Distributed and redundant data processing
   - 3.3 Applications of Blockchain technology

4. Frameworks
   - 4.1 NIST Cyber resilience engineering framework
   - 4.2 OODA-loop: Observe. Orient. Decide. Act.

5. Threat Intelligence
   - 5.1 Techniques, Tactics and Procedures
   - 5.2 Common weaknesses
   - 5.3 Threat Intelligence data

6. DevSecOps best practices
   - 6.1 Ephemeral processes
   - 6.2 Tiered data storage
   - 6.3 Continuous integration, testing and deployment with Caneries
   - 6.4 Availability zones for data and processes
   - 6.5 Avoiding complexity

7. Crisis management
   - 7.1 The Incident Response team
   - 7.2 Incident triage
   - 7.3 Communication
   - 7.4 Recovery planning and execution
   - 7.5 Postmortem

8. Organization and Culture
   - 8.1 Roles and responsibilities
   - 8.2 Security as a first-class citizen in an organization
   - 8.3 Influencing corporate culture
   - 8.4 Leadership buy-in

Literature
Compulsory Reading
Further Reading ▪ Adkins, H. et al (2020): Building Secure and Reliable Systems. First Edition, O'Reilly Media, Newton, MA. ▪ Ross, R. et al (2019): Developing Cyber Resilient Systems: A Systems Security Engineering Approach. (National Institute of Standards and Technology, Gaithersburg, MD), NIST Special Publication 800-160 Volume 2. https://doi.org/10.6028/NIST.SP.800-160v2 ▪ Ross, R. / McEvilley, M. / Oren, J. C. (2016): Systems Security Engineering: Considerations for a Multidisciplinary Approach in the Engineering of Trustworthy Secure Systems. (National Institute of Standards and Technology, Gaithersburg, MD), NIST Special Publication (SP) 800-160, Vol. 1, Includes updates as of March 21, 2018. https://doi.org/10.6028/NIST.SP.800-160v1

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Online Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☐ Guideline
☑ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☑ Exam Template	☑ Slides

Seminar: Applying Threat Intelligence

Course Code: DLMCSEECLS02_E

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Cyber resilience is the practice of accepting that security will never be 100% watertight but the ability to limit damage and quickly detect and respond to incidents is of utmost importance. In this seminar, we examine reports from past incidents and identify threat intelligence, in particular the Techniques, Tactics and Procedures of criminals, that help in identifying effective defenses.

Course Outcomes

On successful completion, students will be able to

- understand weaknesses in an organization's defenses.
- make recommendations on how to make the organization more resilient.
- utilize threat intelligence for secure application and systems design.

Contents

- With a given report, the student will research the incident and independently find threat intelligence reports and data relevant to the given incident. A report will then summarize the security issues responsible for the incident and make recommendations as to how the victim could become more resilient to such attacks. Specific incident reports will be provided by the tutor but proposals by the students can be considered.

Literature

Compulsory Reading

Further Reading

- Adkins, H. et al (2020): Building Secure and Reliable Systems. First Edition, O'Reilly Media, Inc.
- Mitre ATT&CK®: https://attack.mitre.org/
- OASIS Cyber Threat Intelligence: https://www.oasis-open.org/committees/tc_home.php?wg_abbrev=cti
- Ross, R. et al (2019): Developing Cyber Resilient Systems: A Systems Security Engineering Approach. (National Institute of Standards and Technology, Gaithersburg, MD), NIST Special Publication 800-160 Volume 2. https://doi.org/10.6028/NIST.SP.800-160v2

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Seminar

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Research Essay

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

IT Services and Architecture Management

Module Code: DLMDCCEISAM

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	10	300 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimaldauer: 1 Semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Andrew Adjah Sai (Management of IT Services and Architecture) / Prof. Dr. Carsten Skerra (IT Architecture Management)

Contributing Courses to Module

- Management of IT Services and Architecture (MWIT02-01_E)
- IT Architecture Management (DLMBITPAM02)

Module Exam Type

Module Exam	Split Exam
	Management of IT Services and Architecture • Study Format "Distance Learning": Exam, 90 Minutes IT Architecture Management • Study Format "Distance Learning": Written Assessment: Case Study

Weight of Module

see curriculum

Module Contents

Management of IT Services and Architecture

- Basics of IT Service Management and Terminolog
- IT Infrastructure Library (ITIL)
- IT Outsourcing
- IT Architecture Management
- IT Application Portfolio Management
- Structural Organization of IT and Architecture Governance

IT Architecture Management

- Architecture documentation
- Architecture governance
- Enterprise architecture management (EAM)
- IT application portfolio management
- Enterprise architecture patterns
- Architecture framework: TOGAF

Learning Outcomes

Management of IT Services and Architecture

On successful completion, students will be able to

- name, explain and distinguish the basic principles of IT strategy, IT governance and IT architecture management.
- explain and differentiate between the typical activities of IT architecture management, their interrelationships and their dependencies.
- explain the fundamentals and challenges of IT service management.
- describe the motivation and structure of the IT Infrastructure Library (ITIL), explain the main elements and locate specific activities in the service lifecycle.

IT Architecture Management

On successful completion, students will be able to

- understand that having a well-defined IT architecture blueprint in place is key to success for IT organizations.
- analyze the constraints of existing application, infrastructure and information/ data architectures.
- know different types of IT application portfolio management.
- manage enterprise architecture patterns proactively.
- understand how to initiate change requests in order to modify or extend the IT architecture if the introduction or modification of a service is not possible within a given framework.

Links to other Modules within the Study Program	Links to other Study Programs of the University
This module is similar to other modules in the field of Computer Science & Software Development	All Master Programs in the IT & Technology fields

Management of IT Services and Architecture

Course Code: MWIT02-01_E

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

IT service management is an approach to align and understand a company's IT as a service provider and supporter of operational and business processes. Here, the focus is on quality management and handling of daily operations. In addition to specific IT projects, e.g., the development of an IT system or the introduction of standard software, strategic management must be used for the organization-wide IT infrastructure. The task of IT architecture management is the strategic alignment of the IT infrastructure with the organization's business and IT strategy. This course provides concepts, methods, procedures and models for the tasks within the scope of IT architecture management.

Course Outcomes

On successful completion, students will be able to

- name, explain and distinguish the basic principles of IT strategy, IT governance and IT architecture management.
- explain and differentiate between the typical activities of IT architecture management, their interrelationships and their dependencies.
- explain the fundamentals and challenges of IT service management.
- describe the motivation and structure of the IT Infrastructure Library (ITIL), explain the main elements and locate specific activities in the service lifecycle.

Contents

1. IT Service Management Basics and Terms
   - 1.1 IT Services
   - 1.2 IT Service Management
   - 1.3 ITSM Frameworks
2. ITIL 4 - Basics and Four Dimensions
   - 2.1 Stakeholders, Services and Service Management
   - 2.2 Value Contribution of IT
   - 2.3 Four Dimensions Model

3. ITIL 4 - Service Value System
   - 3.1 Basics and Overview
   - 3.2 Inputs, Outcome and Governance
   - 3.3 The Service Value Chain
   - 3.4 Continual Improvement

4. ITIL 4 - Principles
   - 4.1 Overview
   - 4.2 Value Orientation
   - 4.3 Iterative Procedure and Feedback
   - 4.4 Establish Collaboration and Visibility
   - 4.5 Optimize and Automate

5. ITIL 4 - Practices
   - 5.1 Overview
   - 5.2 General Management Practices
   - 5.3 Service Management Practices
   - 5.4 Technical Practices

6. IT Architecture Management Basics and Terms
   - 6.1 IT Enterprise Architecture
   - 6.2 Goals of Enterprise Architecture Management
   - 6.3 Processes in the Management of IT Enterprise Architectures

7. IT Application Portfolio Management
   - 7.1 Overview of IT Application Portfolio Management
   - 7.2 Application Manual
   - 7.3 Portfolio Analysis
   - 7.4 Development Planning

8. Architecture Governance
   - 8.1 Organizational Structure
   - 8.2 Policy Development and Enforcement
   - 8.3 Project Support

Literature
Compulsory Reading
Further Reading ▪ Berger, D., & Shashidhar, N., & Varol, C. (2020). Using ITIL 4 in Security Management. 2020 8th International Symposium on Digital Forensics and Security (ISDFS), Digital Forensics and Security (ISDFS), 2020 8th International Symposium On, 1–6. https://doi-org.pxz.iubh.de:8443/10.1109/ISDFS49300.2020.9116257 ▪ Limited, A. (2019). ITIL 4 Foundation [electronic resource] : ITIL 4 Edition. London The Stationery Office Ltd, 2019. ▪ Limited, A. (2020). ITIL 4 [electronic resource] : Digital and IT Strategy. London The Stationery Office Ltd, 2020. ▪ Limited, A. (2020). ITIL 4 [electronic resource] : Direct, Plan and Improve. Norwich TSO, 2020. ▪ Limited, A. (2020). ITIL 4 [electronic resource] : High Velocity IT. Norwich TSO, 2020. ▪ Limited, A. (2020). ITIL 4 [electronic resource] : Drive Stakeholder Value. Norwich TSO, 2020. ▪ Limited, A. (2020). ITIL 4 [electronic resource] : Create, Deliver and Support. Norwich TSO, 2020.

Study Format Distance Learning

Study Format	**Course Type**
Distance Learning	Online Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☐ Guideline
☑ Shortcast	☑ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☑ Exam Template	☑ Slides

IT Architecture Management

Course Code: DLMBITPAM02

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

The course IT Architecture Management aims to enable students to define a blueprint for the future development of a particular IT landscape, taking into account service strategies and available technologies given to an IT service provider.

Course Outcomes

On successful completion, students will be able to

- understand that having a well-defined IT architecture blueprint in place is key to success for IT organizations.
- analyze the constraints of existing application, infrastructure and information/ data architectures.
- know different types of IT application portfolio management.
- manage enterprise architecture patterns proactively.
- understand how to initiate change requests in order to modify or extend the IT architecture if the introduction or modification of a service is not possible within a given framework.

Contents

1. Introduction to IT Architectures
   - 1.1 The Term “Architecture” in the Context of IT
   - 1.2 Use Cases and Levels of IT Architectures
   - 1.3 Overview on IT Architecture Management
2. Enterprise Architecture Management (EAM)
   - 2.1 IT-Strategy
   - 2.2 Enterprise Architecture
   - 2.3 Roles and Activities in EAM
3. IT Application Portfolio Management
   - 3.1 Application Handbook
   - 3.2 Portfolio Analyses
   - 3.3 Planning the Application Landscape

4. Architecture Framework: TOGAF
   - 4.1 Purpose and Overview on TOGAF
   - 4.2 Architecture Development Method (ADM)
   - 4.3 Guidelines & Techniques
   - 4.4 Architecture Content Framework
   - 4.5 Architecture Capability Framework

5. Architecture Documentation
   - 5.1 Structures, Components, and Interfaces
   - 5.2 Processes and Applications
   - 5.3 Domain Architecture

6. Architecture Governance
   - 6.1 Roles and Committees
   - 6.2 Processes and Decisions
   - 6.3 Management of Architectural Policies

7. Enterprise Architecture Patterns
   - 7.1 Structures, Components, and Interfaces
   - 7.2 Processes and Applications
   - 7.3 Domain Architecture

Literature

Compulsory Reading

Further Reading

- Hanschke, I. (2009). Strategic IT management: A toolkit for enterprise architecture management. Berlin, Heidelberg: Springer. (Database: ProQuest).
- Perroud, T., & Inversini, R. (2013). Enterprise architecture patterns: Practical solutions for recurring IT-architecture problems (Chs. 1-5). Berlin: Springer Berlin Heidelberg. (Database: ProQuest).
- The Open Group Architecture Framework. (2018). TOGAF 9.2 (Chs. 2, 4, 17, 29, 35, scan Chs. 5–16, scan Ch. 18–28, scan Chs. 36–38). (Available on the internet).

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Case Study

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Written Assessment: Case Study

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
110 h	0 h	20 h	20 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☑ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☐ Exam Template	☑ Slides

Product Development and Design Thinking

Module Code: DLMBPDDT

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	10	300 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Dorian Mora (Product Development) / Prof. Dr. Dorian Mora (Design Thinking)

Contributing Courses to Module

- Product Development (DLMBPDDT01)
- Design Thinking (DLMBPDDT02)

Module Exam Type

Module Exam	Split Exam
	Product Development • Study Format "myStudies": Exam, 90 Minutes • Study Format "Distance Learning": Exam, 90 Minutes Design Thinking • Study Format "Distance Learning": Written Assessment: Project Report

Weight of Module

see curriculum

Module Contents

Product Development

- Production planning techniques
- Design tasks
- Product development approaches
- Digital product development and organizational aspects

Design Thinking

This course will put students in the mindset of Design Thinking. Students will be introduced to phases and distinct methods for inspiration, as well as the ideation and implementation of products. A current list of topics is located in the Learning Management System.

Learning Outcomes

Product Development

On successful completion, students will be able to

- know the basic definitions and principles of (new) product development.
- understand the key skills in product development.
- discuss, differentiate, and select appropriate product development approaches with respect to a given scenario.
- work with digital product development tools and techniques like CAD, PDM and PLM at a basic level.
- develop own solutions and approaches to academic and practical questions.
- discuss, evaluate, and adapt different digital product development techniques and tools.

Design Thinking

On successful completion, students will be able to

- comprehend, critically reflect on, and adopt the Design Thinking mindset.
- understand the inspiration, ideation, and implementation phases.
- evaluate and identify appropriate methods from the toolbox of human-centered design for given design tasks and challenges.

Links to other Modules within the Study Program	**Links to other Study Programs of the University**
This module is similar to other modules in the field of Design	All Master Programs in the Design, Architecture & Construction fields

Product Development

Course Code: DLMBPDDT01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

This course aims to provide basic work and problem-solving methods for the successful development of products. It introduces the definition of key design tasks and various alternative product development approaches such as flow-based, lean product development, and design thinking. Finally, the students will become familiar with the use of computer-aided design (CAD) tools and how they integrate into modern product development approaches.

Course Outcomes

On successful completion, students will be able to

- know the basic definitions and principles of (new) product development.
- understand the key skills in product development.
- discuss, differentiate, and select appropriate product development approaches with respect to a given scenario.
- work with digital product development tools and techniques like CAD, PDM and PLM at a basic level.
- develop own solutions and approaches to academic and practical questions.
- discuss, evaluate, and adapt different digital product development techniques and tools.

Contents

1. Introduction
   - 1.1 Basic Definitions
   - 1.2 The Product Development Process
   - 1.3 Indicators and Metrics
   - 1.4 Product Development Models
   - 1.5 Current Trends in Product Development
2. The Product Development Process
   - 2.1 Planning
   - 2.2 Concept Development
   - 2.3 Design
   - 2.4 Testing and Refinement
   - 2.5 Production and Ramp-up

3. Product Development Approaches
   - 3.1 Lean Product Development
   - 3.2 Design Thinking
   - 3.3 Human-Centered Design
   - 3.4 User Experience Strategy
   - 3.5 Open Innovation

4. Digital Tools
   - 4.1 Computer-Aided Design
   - 4.2 Computer-Aided Quality
   - 4.3 Product Data Management
   - 4.4 Product Lifecycle Management

5. Organizational Perspective
   - 5.1 Incremental, Platform, and Breakthrough Development
   - 5.2 Building Teams
   - 5.3 Political Issues in Organizations
   - 5.4 Distributed New Product Development

Literature

Compulsory Reading

Further Reading

- Kahn, K. B., Kay, S. E., Slotegraaf, R. J., & Uban, S. (Eds.). (2012). The PDMA handbook of new productdevelopment (3rd ed.). Hoboken, NJ: John Wiley & Sons. (Database: ProQuest).
- Ottosson, S. (2018). Developing and managing innovation in a fast changing and complex world:Benefiting from dynamic principles. Cham: Springer. (Database: ProQuest).
- Ulrich, K. T., & Eppinger, S. D. (2016). Product design and development (6th ed.). New York, NY:McGraw Hill.

Study Format myStudies

Study Format	Course Type
myStudies	Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☑ Vodcast	☐ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☑ Exam Template	☑ Slides

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Online Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☑ Vodcast	☐ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☑ Exam Template	☑ Slides

Design Thinking

Course Code: DLMBPDDT02

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

In this course, students will receive a hands-on introduction to human-centered design via the Design Thinking method. Beyond conveying the individual basic principles, the procedures in Design Thinking are examined in detail. In order to fully understand Design Thinking in terms of important aspects in practice, selected methods for the individual process steps are presented in theory and application. Students will learn to improve their design process by reflecting on and adapting their activities.

Course Outcomes

On successful completion, students will be able to

- comprehend, critically reflect on, and adopt the Design Thinking mindset.
- understand the inspiration, ideation, and implementation phases.
- evaluate and identify appropriate methods from the toolbox of human-centered design for given design tasks and challenges.

Contents

- The course covers current topics and trends in Design Thinking, illustrating some methods and techniques as well as case studies. Each participant must create a project report on a chosen project, where he/she describes the application of the Design Thinking approach to a real product development scenario.

Literature
Compulsory Reading
Further Reading ▪ IDEO.org. (2015). The Field Guide to Human-Centered Design. A step-by-step guide that will get you solving prob-lems like a designer. Retrieved from http://www.designkit.org/resources/1 ▪ Pressman, Andy (2019): Design Thinking. A Guide to Creative Problem Solving for Everyone, New York : Routledge. ▪ Lockwood, T., & Papke, E. (n.d.). Innovation by design : how any organization can leverage design thinking to pro-duce change, drive new ideas, and deliver meaningful solutions. ▪ Lewrick, M., Link, P., Leifer, L. J., & Langensand, N. (2018). The design thinking playbook : mindful digital transfor-mation of teams, products, services, businesses and ecosystems. John Wiley & Sons.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Project

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Project Report

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

DLMBPDDT02

Internet of Things and Ethical Reflection in Management

Module Code: DLMNMWNEET_E

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	10	300 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimaldauer: 1 Semester		English

Module Coordinator

Dr. Sebastian Lempert (Internet of Things) / Prof. Dr. René Schmidpeter (Seminar: Ethical Reflection in Management)

Contributing Courses to Module

- Internet of Things (DLMBMMIIT01)
- Seminar: Ethical Reflection in Management (DLMNMSERM01_E)

Module Exam Type

Module Exam	Split Exam
	Internet of Things • Study Format "Distance Learning": Exam, 90 Minutes • Study Format "myStudies": Exam, 90 Minutes Seminar: Ethical Reflection in Management • Study Format "Distance Learning": Written Assessment: Research Essay

Weight of Module

see curriculum

Module Contents

Internet of Things

- Consumer use cases and risks
- Business use cases and risks
- Social-economic issues
- Enabling technologies and networking fundamentals

Seminar: Ethical Reflection in Management

In this course, real-life challenges from business practice of different industries are brought to the attention of the students. With the help of ethical reflection as well as the development of proposed solutions, processes and business models, the overcoming of trade-off thinking between profit and sustainability will be promoted.

Learning Outcomes

Internet of Things

On successful completion, students will be able to

- distinguish and discuss a broad range of use cases for the internet of things (IoT).
- understand and reflect upon the different perspectives on IoT.
- apply distinct techniques to engineer internet-of-things products.
- evaluate and identify appropriate IoT communication technology and standards according to given IoT product requirements.
- reflect on the respective theoretical foundation, evaluate different approaches, and apply appropriate approaches to practical questions and cases.

Seminar: Ethical Reflection in Management

On successful completion, students will be able to

- develop an understanding of various ontological approaches and applications to economics.
- apply their knowledge of various ethical theories and approaches to management and current discussions.
- develop approaches to identify, reflect on, and overcome trade-offs.
- build an appropriate analytical framework of reflection for evaluating business challenges.

Links to other Modules within the Study Program	Links to other Study Programs of the University
This module is similar to other modules in the field of Computer Science & Software Development and Business Administration & Management	All Master Programs in the IT & Technology field

Internet of Things

Course Code: DLMBMMIIT01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

The Internet of Things (IoT), once a rough vision, has become reality today in a broad manner. There is a plethora of devices and services available to both consumers and businesses. From smart homes to smart cities, from smart devices to smart factories – internet-of-things technologies impact on our lives and environments. This course follows a top-down approach, discussing a broad set of aspects connected with the internet of things. It starts with use cases and risks from the perspectives of customers and businesses and winds up with a technical foundation of the internet of things. To address the engineering perspective, a set of techniques is proposed.

Course Outcomes

On successful completion, students will be able to

- distinguish and discuss a broad range of use cases for the internet of things (IoT).
- understand and reflect upon the different perspectives on IoT.
- apply distinct techniques to engineer internet-of-things products.
- evaluate and identify appropriate IoT communication technology and standards according to given IoT product requirements.
- reflect on the respective theoretical foundation, evaluate different approaches, and apply appropriate approaches to practical questions and cases.

Contents

1. Introduction into the Internet of Things
   - 1.1 Foundations and Motivations
   - 1.2 Potential and Challenges
2. Social and Business Relevance
   - 2.1 Innovations for Consumers and Industry
   - 2.2 Impact on Human and Work Environment
   - 2.3 Privacy and Security

3. Architectures of Internet of Things and Industrial Internet of Things
   - 3.1 Elements of IoTs and IIoTs
   - 3.2 Sensors and Nodes
   - 3.3 Power Systems
   - 3.4 Fog Processors
   - 3.5 Platforms

4. Communication Standards and Technologies
   - 4.1 Network Topologies
   - 4.2 Network Protocols
   - 4.3 Communication Technologies

5. Data Storage and Processing
   - 5.1 NoSQL and MapReduce
   - 5.2 Linked Data and RDF(S)
   - 5.3 Semantic Reasoning
   - 5.4 Complex Event Processing
   - 5.5 Machine Learning
   - 5.6 Overview of Existing Data Storage and Processing Platforms

6. Fields of Application
   - 6.1 Smart Home/Living
   - 6.2 Smart Buildings
   - 6.3 Ambient Assisted Living
   - 6.4 Smart Energy/Grid
   - 6.5 Smart Factory
   - 6.6 Smart Logistics
   - 6.7 Smart Healthcare
   - 6.8 Smart Agriculture

Literature
Compulsory Reading
Further Reading ▪ Lea, P. (2018). Internet of things for architects: Architecting IoT solutions by implementing sensors, communication infrastructure, edge computing, analytics, and security. Birmingham: Packt Publishing Ltd. (Database: Dawson). ▪ McEwen, A., & Cassimally, H. (2013). Designing the internet of things. Chichester: John Wiley & Sons. (Database: ProQuest). ▪ Raj, P., & Raman, A. C. (2017). The Internet of Things: Enabling technologies, platforms, and use cases. Boca Raton, FL: Auerbach Publications. (Database: ProQuest). ▪ Weber, R. H., & Weber, R. (2010). Internet of Things. Heidelberg: Springer. (Database: Dawson).

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Online Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods		
☐ Learning Sprints®	☐ Review Book	☐ Sprint
☑ Course Book	☐ Creative Lab	☐ Interactive Online Lecture
☐ Vodcast	☐ Guideline	
☑ Shortcast	☑ Live Tutorium/Course Feed	
☑ Audio	☐ Reader	
☑ Exam Template	☑ Slides	

Study Format myStudies

Study Format	Course Type
myStudies	Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods		
☐ Learning Sprints®	☐ Review Book	☐ Sprint
☑ Course Book	☐ Creative Lab	☐ Interactive Online Lecture
☐ Vodcast	☐ Guideline	
☑ Shortcast	☑ Live Tutorium/Course Feed	
☑ Audio	☐ Reader	
☑ Exam Template	☑ Slides	

Seminar: Ethical Reflection in Management

Course Code: DLMNMSERM01_E

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

In this course, economic-philosophical and epistemological thinking and action will be applied in a practice-oriented manner. Ethics in the sense of reflecting on one's own possibilities for action should show students new perspectives for problem solving. Current approaches to theories of science and their application in management are discussed and an ethical model of reflection is developed. This should help the students to find their own concrete fields of application and to develop solution strategies. The aim is to overcome the classic trade-off thinking between economic efficiency and ethical demands and thus to promote an integrative mindset in the students thinking and acting.

Course Outcomes

On successful completion, students will be able to

- develop an understanding of various ontological approaches and applications to economics.
- apply their knowledge of various ethical theories and approaches to management and current discussions.
- develop approaches to identify, reflect on, and overcome trade-offs.
- build an appropriate analytical framework of reflection for evaluating business challenges.

Contents

- Current developments in philosophy of science and philosophy: Overview of various ontological approaches and applications to economics.
- Overview of various ethical theories and approaches to management and current discussions thereof.

Literature
Compulsory Reading
Further Reading ▪ Glauner, F. (2016): CSR and value cockpits. Measurement and control systems of corporate culture. 2nd edition, Gabler Verlag, Berlin. ▪ Schneider, A./Schmidpeter, R. (2015): Corporate Social Responsibility. Responsible Corporate Governance in Theory and Practice. 2nd edition, Gabler Verlag, Berlin. ▪ Von Müller, A. (2020): The self-development of the world. An invitation to rethink time and reality and to deal with complexity differently. 1st edition, Siedler Verlag. München. ▪ Wieland, J. (2014): Governance Ethics: Global value creation, economic organization and normativity. 1. Auflage, Springer International Publishing, Switzerland.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Seminar

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Research Essay

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

Process Management with Scrum

Module Code: DLMPREEPMS

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	▪ none ▪ DLMPREEPMS01	MA	10	300 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Thomas Bolz (Process Management with Scrum) / Prof. Dr. Thomas Bolz (Project: Corporate Project with Scrum)

Contributing Courses to Module

- Process Management with Scrum (DLMPREEPMS01)
- Project: Corporate Project with Scrum (DLMPREEPMS02)

Module Exam Type

Module Exam	Split Exam
	Process Management with Scrum • Study Format "Distance Learning": Written Assessment: Case Study Project: Corporate Project with Scrum • Study Format "Distance Learning": Written Assessment: Project Report

Weight of Module

see curriculum

Module Contents

Process Management with Scrum

- Scrum Origin, Basic Idea and Fields of Application
- Scrum Roles
- Product Backlog and Sprint Planning
- Executing the Scrum Process
- Helpful Tools
- Implementation and Scaling of Scrum

Project: Corporate Project with Scrum

After studying the methods of Scrum and learning about the systematic development approach, this course offers the opportunity to transfer the learned contents to practice. Choosing a real project or task within an organization, the method can be experienced and compared to the theoretical concept.

Learning Outcomes

Process Management with Scrum

On successful completion, students will be able to

- understand and explain the contents of the agile manifest.
- understand Scrum as a framework for developing, delivering, and sustaining products in a complex environment.
- describe each of the roles within a Scrum team and explain each item and each step within the Scrum process.
- handle the refinement process of the product backlog and discuss the interaction within the team and to the outside world during and after a sprint.
- understand the concept of user stories and apply the method to simple cases.
- understand and describe possibilities for the scaling of Scrum.

Project: Corporate Project with Scrum

On successful completion, students will be able to

- understand Scrum and its roles within the context of a corporate organization.
- explain the elements and processes of Scrum in detail and out of practical experience.
- create user stories, refine the product backlog and select items for a sprint.
- collaborate in the daily scrum and apply the little tools within the development team.
- discuss critically the benefits and limitations of the Scrum framework.

Links to other Modules within the Study Program	Links to other Study Programs of the University
This module is similar to other moduls in the field of Project Management	All Master Programs in the Business & Management field

Process Management with Scrum

Course Code: DLMPREEPMS01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Within the broad field of project management, Scrum falls into the category of agile methods. As such, Scrum is more of a process management framework than a project management method. In this course the Scrum framework will be described and discussed in detail. The Agile Manifesto will be introduced, and the basic idea of iterative and incremental development will be discussed, leading up to the methodology of Scrum. A thorough review will be done on the different roles within the Scrum team. The terms product backlog, refinement and increment are defined and explained. As core feature of Scrum, the execution of sprints and daily scrums will be detailed. For the practical application of Scrum, the handling of requirements and creation of user stories will be introduced. The student also gets to know the little tools for communication and task-tracking used within development teams. Furthermore, the student will learn when and how a Scrum process should be implemented and what kind of benefits and risks can be expected from it.

Course Outcomes

On successful completion, students will be able to

- understand and explain the contents of the agile manifest.
- understand Scrum as a framework for developing, delivering, and sustaining products in a complex environment.
- describe each of the roles within a Scrum team and explain each item and each step within the Scrum process.
- handle the refinement process of the product backlog and discuss the interaction within the team and to the outside world during and after a sprint.
- understand the concept of user stories and apply the method to simple cases.
- understand and describe possibilities for the scaling of Scrum.

Contents

1. Scrum Origin, Basic Idea and Fields of Application
   - 1.1 The Birth of Scrum – How and Why it All Began
   - 1.2 The Agile Manifesto and a Change in Perspective
   - 1.3 The Approach of Iterative and Incremental Development
   - 1.4 Defining Fields for Scrum and Fields for Not Scrum

2. Scrum Roles
   - 2.1 The Development Team
   - 2.2 The Product Owner
   - 2.3 The Scrum Master
   - 2.4 The Customer Involvement
   - 2.5 The Organization

3. Product Backlog and Sprint Planning
   - 3.1 Principles of a Product Backlog
   - 3.2 Refinement Process
   - 3.3 Definition of Ready
   - 3.4 Determining Capacity
   - 3.5 Selecting Items and Defining the Sprint Goal

4. Executing the Scrum Process
   - 4.1 The Scrum Process
   - 4.2 Sprint Cycle
   - 4.3 Daily Scrum
   - 4.4 Sprint Review
   - 4.5 Sprint Retrospective

5. Helpful Tools
   - 5.1 Requirements and User Stories
   - 5.2 Planning Poker
   - 5.3 Communication Tools (e. g. Task Board)
   - 5.4 Tracking Tools (e. g. Burn-down Chart)
   - 5.5 Available Software Tools

6. Implementation and Scaling of Scrum
   - 6.1 Implementation of Scrum in a Company
   - 6.2 Chances, Risks, and Limitations of Scrum
   - 6.3 Scrum of Scrums
   - 6.4 The Nexus Framework for Scaling Scrum
   - 6.5 Other Approaches

Literature
Compulsory Reading
Further Reading ▪ Anon. (2001): Manifesto for Agile Software Development. (URL: https://agilemanifesto.org [Retrieved: 20.03.2021]). ▪ Ockerman, S./ Reindl, S. (2019): Mastering Professional Scrum: Coaches' Notes for Busting Myths, Solving Challenges, and Growing Agility. Addison Wesley Longman, Boston. ▪ Rubin, K. S. (2013): Essential Scrum: A Practical Guide to the Most Popular Agile Process. Addison-Wesley Professional, Boston. ▪ Schwaber, K. / Sutherland, J. V. (2012): Software in 30 days: How Agile Managers Beat the Odds, Delight their Customers and Leave Competitors in the Dust. Wiley, New Jersey. ▪ Sutherland, J. (2015): Scrum: The art of Doing Twice the Work in Half the Time. Random House UK, London. ▪ Verheyen, G. (2019): Scrum: A Pocket Guide: a Smart Travel Companion. 2nd edition, Van Haren Publishing, VW 's-Hertogenbosch.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Case Study

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Written Assessment: Case Study

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
110 h	0 h	20 h	20 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☑ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☐ Exam Template	☑ Slides

Project: Corporate Project with Scrum

Course Code: DLMPREEPMS02

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	DLMPREEPMS01

Course Description

The course „Project: Corporate Project with Scrum" is building on the basic knowledge of the Scrum Framework acquired in the previous course. The theoretical foundations of Scrum can be applied within a real company environment. The student experiences the advantages of agile work and can reflect on the Scrum roles in practice. The student is also confronted with the hurdles that arise in applying the methodology in a real situation and can experiment with own approaches to solutions.

Course Outcomes

On successful completion, students will be able to

- understand Scrum and its roles within the context of a corporate organization.
- explain the elements and processes of Scrum in detail and out of practical experience.
- create user stories, refine the product backlog and select items for a sprint.
- collaborate in the daily scrum and apply the little tools within the development team.
- discuss critically the benefits and limitations of the Scrum framework.

Contents

- The course „Project: Corporate Project with Scrum" is building on the basic knowledge of the Scrum Framework acquired in the previous course and on the general knowledge of management know-how and classical project management acquired during the previous semesters. Based on a real task to be resolved within an organization (commercial enterprise, public administration, or the like), the students can gain practical experience working with agile methods utilizing the Scrum Framework.
- The students will reflect critically on the similarities and differences they observed and, if applicable, also compare the experienced agile methods with classical methods of project management. To meet scientific criteria, a literature search and a thorough comparison of the scientific and methodological foundation to the practical aspects experienced in the project is strongly encouraged and supported. The business aspect (costs, gain, time, quality, strategic relevance, etc.) of the project should be recognized and analyzed based on scientific methods. The students will demonstrate their ability to combine specialist knowledge and transfer of this knowledge to a specific project in a professional environment. They will also critically reflect on the experienced own work with Scrum, as well as on the theoretical concept of the Scrum Framework itself.

Literature
Compulsory Reading
Further Reading ▪ Anon. (2001): Manifesto for Agile Software Development. (URL: https://agilemanifesto.org [Retrieved: 20.03.20201]). ▪ Ockerman, S./ Reindl, S. (2019): Mastering Professional Scrum: Coaches' Notes for Busting Myths, Solving Challenges, and Growing Agility. Addison Wesley Longman, Boston. ▪ Rubin, K. S. (2013): Essential Scrum: A Practical Guide to the Most Popular Agile Process. Addison-Wesley Professional, Boston. ▪ Schwaber, K. / Sutherland, J. V. (2012): Software in 30 days: How Agile Managers Beat the Odds, Delight their Customers and Leave Competitors in the Dust. Wiley, New Jersey. ▪ Sutherland, J. (2015): Scrum: The art of Doing Twice the Work in Half the Time. Random House UK, London. ▪ Verheyen, G. (2019): Scrum: A Pocket Guide: a Smart Travel Companion. 2nd edition, Van Haren Publishing, VW 's-Hertogenbosch.

Study Format Distance Learning

Study Format	**Course Type**
Distance Learning	Project

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Project Report

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

DLMPREEPMS02

Project Management within Operations

Module Code: DLMPREEPMO

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	None	MBA MA	10	300 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Philippe Tufinkgi (Operations and Information Management) / Prof. Dr. Philippe Tufinkgi (Project: Operations Projects)

Contributing Courses to Module

- Operations and Information Management (DLMBAEOIM01)
- Project: Operations Projects (DLMPREEPMO02)

Module Exam Type

Module Exam	Split Exam
	Operations and Information Management • Study Format "myStudies": Written Assessment: Case Study • Study Format "Distance Learning": Written Assessment: Case Study Project: Operations Projects • Study Format "Distance Learning": Written Assessment: Project Report

Weight of Module

see curriculum

Module Contents

Operations and Information Management

- Preparation of Reliable Demand Forecasts
- Site Planning
- Process Design and Process Planning
- Inventory Management and Production Control
- Information Systems in the Supply Chain
- Behavioral Operations Management

Project: Operations Projects

The course is building on the basic knowledge of operations and information management as well as on general project management know-how. The students apply a selection of the learned methods in a project for improvement or change within the Operations unit of a company. The special challenges of running a project in the context of existing day-to-day routines is experienced.

Learning Outcomes

Operations and Information Management

On successful completion, students will be able to

- apply selected and practice-oriented concepts of operations management in various tasks and draw appropriate conclusions for verifiable performance improvements.
- critically evaluate the benefits and limitations of modern and process-oriented software solutions in operations management.
- consider current and future developments in connection with the megatrends of digitization and climate protection in operations management.
- support the analysis, planning, and design of value-adding processes in supply chains through modern information systems.
- understand and anticipate the behavior of decision-makers and their individual preferences in order to better predict the actual behavior of the supply chain partners and optimize the achievement of own objectives.

Project: Operations Projects

On successful completion, students will be able to

- describe and explain the real-life operational work of a company.
- understand the implications of information management.
- analyze needs and opportunities for improvement of specific operational processes.
- define and set up a project within the operational environment.
- implement an improvement or change in operational processes.

Links to other Modules within the Study Program	Links to other Study Programs of the University
This module is similar to other modules in the field of Business Administration & Management	All Master Programs in the Business & Management field

Operations and Information Management

Course Code: DLMBAEOIM01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MBA	English		5	None

Course Description

Operations management comprises the planning, control, execution, and monitoring of all internal company resources and capacities for the manufacture of products and services. This course provides students with the knowledge and skills to apply theoretically-sound and practice-relevant concepts of operations management in the context of different problems and tasks (taking into account central megatrends) and draw process-relevant conclusions for verifiable performance improvements. The consideration of powerful software solutions plays an important role here. Starting from the creation of reliable demand forecasts, different scenarios for the optimal location decisions of companies are considered. The process design defines the basic framework for processes, decision rules, and process performance analyses. This then shows in the subsequent process planning how optimal sequences for orders are calculated under certain priority rules. In inventory management, various models for inventory optimization are considered in order to apply practice-relevant methods for calculating capacities and production plans, taking into account various restrictions. Supply chain management investigates how independent companies can optimally coordinate their activities and promote cross-company communication through the use of sustainable information systems. Concluding the course is an examination of human decision heuristics and preferences and their anticipation of decision behavior within the framework of behavioral operations management.

Course Outcomes

On successful completion, students will be able to

- apply selected and practice-oriented concepts of operations management in various tasks and draw appropriate conclusions for verifiable performance improvements.
- critically evaluate the benefits and limitations of modern and process-oriented software solutions in operations management.
- consider current and future developments in connection with the megatrends of digitization and climate protection in operations management.
- support the analysis, planning, and design of value-adding processes in supply chains through modern information systems.
- understand and anticipate the behavior of decision-makers and their individual preferences in order to better predict the actual behavior of the supply chain partners and optimize the achievement of own objectives.

Contents

7. Behavioral operations management
   - 7.1 Decision heuristics for solving complex problems
   - 7.2 Decision behavior and decision prognosis
   - 7.3 Decision influencing

Literature

Compulsory Reading

Further Reading

- Bozarth, C. C. & Handfield, R. B. (2019). Introduction to operations and supply chain management (5th ed.). Pearson Education Limited.
- Das, A. (2015). An introduction to operations management: The joy of operations. Routledge.
- Hill, A., & Hill, T. (2018). Essential operations management (2nd ed.). Red Globe Press.
- Slack, N. & Brandon-Jones, A. (2018). Operations and process management: Principles and practice for strategic impact. Pearson.

Study Format myStudies

Study Format	Course Type
myStudies	Case Study

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Written Assessment: Case Study

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
110 h	0 h	20 h	20 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☑ Shortcast	☑ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☐ Exam Template	☑ Slides

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Case Study

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Written Assessment: Case Study

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
110 h	0 h	20 h	20 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☑ Shortcast	☑ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☐ Exam Template	☑ Slides

Project: Operations Projects

Course Code: DLMPREEPMO02

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Operational processes have the characteristics of running an operation in steady state, without allowing changes to the work processes in place. Any project in the Operations arena must therefore be either an improvement or a change project. After analyzing needs for improvement in specific operational processes using methods of operations and information management, project management can be applied to initiate changes. The project definition and execution must consider the specifics of daily business in an operational environment.

Course Outcomes

On successful completion, students will be able to

- describe and explain the real-life operational work of a company.
- understand the implications of information management.
- analyze needs and opportunities for improvement of specific operational processes.
- define and set up a project within the operational environment.
- implement an improvement or change in operational processes.

Contents

- The course is building on the basic knowledge of operations and information management and on general project management know-how. As operational processes have the characteristics of running an operation in steady state, any project within Operations must address either an improvement or a change to the existing processes. After analyzing possible needs for improvement in specific operational processes – applying the structured analytical methodologies commonly used in operations management – appropriate project management methods can be applied to initiate the identified changes. The project definition and execution must consider the specifics of daily business in an operational environment. The students can gain practical experience in setting up and running a project without noticeably interrupting the ongoing operational processes.
- During their work, the students will have the opportunity to compare their real-life experience with the theoretical concepts. The students will reflect critically on the similarities and differences they observed. To meet scientific criteria, a literature search and a thorough comparison of the scientific and methodological foundation to the practical aspects experienced in the project is strongly encouraged and supported. The business aspect (costs, gain, time, quality, strategic relevance, etc.) as outcome of the analysis and as

project result should be recognized and discussed based on scientific methods. The students will demonstrate their ability to combine specialist knowledge and transfer of this knowledge to a specific project in a professional environment

Literature
Compulsory Reading
Further Reading ▪ Bozarth, C. C./Handfield, R. B. (2019): Introduction to operations and supply chain management. Pearson, Harlow, England. ▪ Carvalho, A. M./Sampaio, P./Rebentisch, E. (2019): On Agile Metrics for Operations Management: Measuring and Aligning Agility with Operational Excellence. In: 2019 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM), 1601–1605. ▪ Project Management Institute (2017): PMBOK Guide. A guide to the project management body of knowledge. Sixth edition, PA: Project Management Institute, Newtown Square. ▪ Slack, N./Brandon-Jones, A. (2018): Operations and process management. Principles and practice for strategic impact. Harlow, England Pearson Education Limited, 2018.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Project

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Project Report

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

DLMPREEPMO02

Project Management with PRINCE2®

Module Code: DLMPREEPMPR

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	▪ DLMPREEPMPR01 ▪ none	MA	10	300 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Margit Sarstedt (Project Management with PRINCE2®) / Prof. Dr. Margit Sarstedt (Project: Corporate Project with PRINCE2®)

Contributing Courses to Module

- Project Management with PRINCE2® (DLMPREEPMPR01)
- Project: Corporate Project with PRINCE2® (DLMPREEPMPR02)

Module Exam Type

Module Exam	Split Exam
	Project Management with PRINCE2® • Study Format "Distance Learning": Written Assessment: Case Study Project: Corporate Project with PRINCE2® • Study Format "Distance Learning": Written Assessment: Project Report

Weight of Module

see curriculum

Module Contents

Project Management with PRINCE2®

- Introduction to the PRINCE2® Method
- The Seven Themes
- The Seven Processes
- Creation of Results
- Tailoring
- PRINCE2® Agile

Project: Corporate Project with PRINCE2®

After studying the methods of the structured project management approach of PRINCE2®, this course offers the opportunity to transfer the learned contents to practice. Choosing a real project or task within an organization, the method can be experienced and compared to the theoretical concept.

Learning Outcomes

Project Management with PRINCE2®

On successful completion, students will be able to

- understand and explain the contents of the PRINCE2® framework.
- explain the seven Principles, seven Themes, seven Processes and Tailoring of the project environment.
- describe each of the roles within a PRINCE2® management team.
- explain, how the stages are connected by the defined processes.
- define reporting cycles according to the PRINCE2® guidelines.
- understand and describe how PRINCE2® can be combined with other project management methods and what additional options PRINCE2® Agile is offering.

Project: Corporate Project with PRINCE2®

On successful completion, students will be able to

- understand PRINCE2® and its principles within the context of a corporate organization.
- explain the PRINCE2® Project Management structure as well as the themes and processes of PRINCE2® in detail and out of practical experience.
- set up a Project Management Team with its associated roles.
- start and initiate a project and plan a project stage.
- work with and create management products and specialized products.
- discuss critically the benefits and limitations of the PRINCE2® framework.

Links to other Modules within the Study Program	Links to other Study Programs of the University
This module is similar to other modules in the field of Project Management	All Master Programs in the Business & Management field

Project Management with PRINCE2®

Course Code: DLMPREEPMPR01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Within the broad field of project management methods, the original PRINCE2® method falls into the category of classical (non-agile) methods. It is one of the leading classical project management methods. PRINCE2® is process-oriented and primarily concerned with the actions of the project management team, putting emphasis on the management aspect of a project rather than the execution side. In this course the PRINCE2® framework will be systematically described and discussed in detail. A thorough review will be done on the seven Principles, the seven Themes, the seven Processes, and on Tailoring of the project to the environment. This will be put in relation to the defined roles within the PRINCE2® project management team structure. In this course, in addition to the actions and processes handled by the project management team, the work of the task managers will be reviewed, some of the most important tools for execution of tasks will be introduced and a possible combination with the PMBOK from the PMI will be discussed. The student will learn about the well-structured interaction between project management level and project execution level including the reporting cycles. At the end of the course an outlook on the features of PRINCE2® Agile will be given. The student will gain a thorough understanding of the advantages and disadvantages of the PRINCE2® method and its derivatives.

Course Outcomes

On successful completion, students will be able to

- understand and explain the contents of the PRINCE2® framework.
- explain the seven Principles, seven Themes, seven Processes and Tailoring of the project environment.
- describe each of the roles within a PRINCE2® management team.
- explain, how the stages are connected by the defined processes.
- define reporting cycles according to the PRINCE2® guidelines.
- understand and describe how PRINCE2® can be combined with other project management methods and what additional options PRINCE2® Agile is offering.

Contents

6. PRINCE2® Agile
   - 6.1 Goal of PRINCE2® Agile
   - 6.2 Overview of PRINCE2® Agile
   - 6.3 Similarities and Differences to the Original PRINCE2®

Literature

Compulsory Reading

Further Reading

- AXELOS Limited (2017): Managing Successful Projects with Prince2. TSO, London.
- Bentley, C. (2019): The Concise PRINCE2®: Principles and Essential Themes. 3rd ed., IT Governance Publishing, Cambridgeshire.
- Cooke, J. L. (2016): PRINCE2 Agile An Implementation Pocket Guide: Step-by-Step Advice for Every Project Type. IT GOVERNANCE PUBLISHING, New York.
- International Conference on Electronics, Computers and Artificial Intelligence; Universitatea din Piteşti; Institute of Electrical and Electronics Engineers; IEEE Industry Applications Society; ECAI (2017). Proceedings of the 9th International Conference on Electronics, Computers and Artificial Intelligence - ECAI-2017: 29 June - 01 July 2017, IEEE: New Jersey.
- Mathis, B. (2014): Prince2 for Beginners: Prince2 Study Guide for certification & project management. N.p.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Case Study

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Written Assessment: Case Study

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
110 h	0 h	20 h	20 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☑ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☐ Exam Template	☑ Slides

Project: Corporate Project with PRINCE2®

Course Code: DLMPREEPMPR02

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	DLMPREEPMPR01

Course Description

The course „Project: Corporate Project with PRINCE2®" is building on the basic knowledge of the PRINCE2® framework acquired in the previous course. The studied theoretical concept can be applied within a real company environment. The student experiences the advantages of project management in stages and can reflect on the relation between project management and task execution. The student is also confronted with the hurdles that arise in applying the methodology in a real situation and can experiment with own approaches to solutions.

Course Outcomes

On successful completion, students will be able to

- understand PRINCE2® and its principles within the context of a corporate organization.
- explain the PRINCE2® Project Management structure as well as the themes and processes of PRINCE2® in detail and out of practical experience.
- set up a Project Management Team with its associated roles.
- start and initiate a project and plan a project stage.
- work with and create management products and specialized products.
- discuss critically the benefits and limitations of the PRINCE2® framework.

Contents

- The course „Project: Corporate Project with PRINCE2®" is building on the basic knowledge of the PRINCE2® framework acquired in the previous course and on the general knowledge of management know-how and classical project management acquired during the previous semesters. Based on a real task to be resolved within an organization (commercial enterprise, public administration, or the like), the students can gain practical experience in setting up a project management team according to PRINCE2®.
- The students will reflect critically on the similarities and differences they observed, and, if applicable, also compare the experienced classical methods with agile methods of project management. To meet scientific criteria, a literature search and a thorough comparison of the scientific and methodological foundation to the practical aspects experienced in the project is strongly encouraged and supported. The business aspect (costs, gain, time, quality, strategic relevance, etc.) of the project should be recognized and analyzed based on scientific methods. The students will demonstrate their ability to combine specialist

knowledge and transfer of this knowledge to a specific project in a professional environment. They will also critically reflect on the experienced own work with PRINCE2®, as well as on the theoretical concept of the PRINCE2® framework itself.

Literature

Compulsory Reading

Further Reading

- AXELOS Limited (2017): Managing Successful Projects with Prince2. TSO, London.
- Bentley, C. (2019): The Concise PRINCE2®: Principles and Essential Themes. 3rd ed., IT Governance Publishing, Cambridgeshire.
- Cooke, J. L. (2016): PRINCE2 Agile An Implementation Pocket Guide: Step-by-Step Advice for Every Project Type. IT GOVERNANCE PUBLISHING, New York.
- International Conference on Electronics, Computers and Artificial Intelligence; Universitatea din Piteşti; Institute of Electrical and Electronics Engineers; IEEE Industry Applications Society; ECAI (2017). Proceedings of the 9th International Conference on Electronics, Computers and Artificial Intelligence - ECAI-2017: 29 June - 01 July 2017, IEEE: New Jersey.
- Mathis, B. (2014): Prince2 for Beginners: Prince2 Study Guide for certification & project management. N.p.

Study Format Distance Learning

Study Format	**Course Type**
Distance Learning	Project

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Project Report

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
120 h	0 h	30 h	0 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

IT Governance, Compliance and Service Management

Module Code: DLMDCCEIGCSM

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	none	MA	10	300 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Eric Guiffo Kaigom (Advanced Mathematics) / Johannes Kent Walter (Corporate Governance of IT, Compliance, and Law)

Contributing Courses to Module

- Advanced Mathematics (DLMDSAM01)
- Corporate Governance of IT, Compliance, and Law (DLMIGCR01-01_E)

Module Exam Type

Module Exam	Split Exam
	Advanced Mathematics • Study Format "myStudies": Exam, 90 Minutes • Study Format "Distance Learning": Exam, 90 Minutes (100) Corporate Governance of IT, Compliance, and Law • Study Format "Distance Learning": Exam, 90 Minutes • Study Format "myStudies": Exam, 90 Minutes

Weight of Module

see curriculum

Module Contents

Advanced Mathematics

- IT infrastructure library (ITIL)
- ITIL service strategy
- ITIL service design
- ITIL service transition
- ITIL service operation

Corporate Governance of IT, Compliance, and Law

- IT Governance: Motivation and Challenges
- COBIT Framework
- IT Compliance
- IT basic protection according to BSI IT law

Learning Outcomes

Advanced Mathematics

On successful completion, students will be able to

- remember the fundamental rules of differentiation and integration.
- apply integration and differentiation techniques to vectors and vector fields.
- analyze matrix equations.
- understand the generalization of vectors to tensors.
- evaluate different metrics from information theoretical perspectives.

Corporate Governance of IT, Compliance, and Law

On successful completion, students will be able to

- explain the terms IT governance and IT compliance.
- categorize typical processes and activities from the area of IT governance and IT compliance.
- give an overview of the COBIT framework and its elements.
- give an overview of IT-Governance and explain its structure.
- reproduce important laws and regulations in the field of IT law and explain their areas of application.

Links to other Modules within the Study Program	Links to other Study Programs of the University
This module is similar to other modules in the field of Computer Science & Software Development	All Master Programs in the IT & Technology field

Advanced Mathematics

Course Code: DLMDSAM01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

Modern techniques to analyze data and derive predictions for future events are deeply rooted in mathematical techniques.The course builds a solid base to understand the concepts behind advanced algorithms used to process, analyze, and predict data and observations and enables students to follow future research, especially in the fields of data-intensive sciences.The course reviews differentiation and integration and then discusses partial differentiation, differentiation, vector algebra and vector calculus. Matrix calculation and vector spaces are fundamental to many modern data processing algorithms and are discussed in detail. Calculations based on Tensors are introduced.Common metrics are discussed from an informational, theoretical point of view.

Course Outcomes

On successful completion, students will be able to

- remember the fundamental rules of differentiation and integration.
- apply integration and differentiation techniques to vectors and vector fields.
- analyze matrix equations.
- understand the generalization of vectors to tensors.
- evaluate different metrics from information theoretical perspectives.

Contents

1. Calculus
   - 1.1 Differentiation & Integration
   - 1.2 Partial Differentiation & Integration
   - 1.3 Vector Analysis
   - 1.4 Calculus of Variations
2. Integral Transformations
   - 2.1 Convolution
   - 2.2 Fourier Transformation

3. Vector Algebra
   - 3.1 Scalars and Vectors
   - 3.2 Addition, Subtraction of Vectors
   - 3.3 Multiplication of Vectors, Vector Product, Scalar Product

4. Vector Calculus
   - 4.1 Integration of Vectors
   - 4.2 Differentiation of Vectors
   - 4.3 Scalar and Vector Fields
   - 4.4 Vector Operators

5. Matrices and Vector Spaces
   - 5.1 Basic Matrix Algebra
   - 5.2 Determinant, Trace, Transpose, Complex, and Hermitian Conjugates
   - 5.3 Eigenvectors and Eigenvalues
   - 5.4 Diagonalization
   - 5.5 Tensors

6. Information Theory
   - 6.1 MSE
   - 6.2 Gini Index
   - 6.3 Entropy, Shannon Entropy, Kulback Leibler Distance
   - 6.4 Cross Entropy

Literature

Compulsory Reading

Further Reading

- Riley, K. F., Hobson, M. P, & Bence, S. J. (2006). Mathematical methods for physics and engineering (2nd ed.). Cambridge University Press.
- Strang, G. (2016). Introduction to linear algebra. Wellesley-Cambridge Press .

Study Format myStudies

Study Format	Course Type
myStudies	Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☑ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☐ Guideline
☑ Shortcast	☑ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☑ Exam Template	☑ Slides

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Online Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☑ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☐ Guideline
☑ Shortcast	☑ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☑ Exam Template	☑ Slides

Corporate Governance of IT, Compliance, and Law

Course Code: DLMIGCR01-01_E

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		5	none

Course Description

In this course, students learn terms and frameworks related to IT governance and IT compliance. First, a short introduction and an overview of the different aspects of IT governance and IT compliance are given; then, COBIT and IT basic protection are explained as two frameworks that are used in industrial practice. In addition, this course will introduce and discuss important legal frameworks and standards related to IT law.

Course Outcomes

On successful completion, students will be able to

- explain the terms IT governance and IT compliance.
- categorize typical processes and activities from the area of IT governance and IT compliance.
- give an overview of the COBIT framework and its elements.
- give an overview of IT-Governance and explain its structure.
- reproduce important laws and regulations in the field of IT law and explain their areas of application.

Contents

1. IT Governance: Motivation and Challenges
   - 1.1 Governance and IT Governance
   - 1.2 Frameworks for IT Governance
   - 1.3 Typical IT Governance, Service Management, and Security Frameworks and Standards
2. COBIT Framework
   - 2.1 Overview of the Elements of COBIT
   - 2.2 Governance and Management Objectives
   - 2.3 Use of COBIT and COBIT Design Factors
   - 2.4 The Target Cascade of COBIT

3. IT Compliance
   - 3.1 Introduction to IT Compliance
   - 3.2 Examples of National and International Guidelines: Risk Management Standards and Frameworks
   - 3.3 IT Compliance: Typical Measures

4. Basic IT Protection According to BSI
   - 4.1 Overview and Structure
   - 4.2 Approach to IT Security Governance
   - 4.3 Usage Example of IT Security Governance

5. Introduction to IT Service Management
   - 5.1 What is Information Technology Service Management?
   - 5.2 What is ITIL® V4?
   - 5.3 What is ISO/IEC 20000-1:2018?
   - 5.4 Other ITSM Frameworks and Standards

6. IT Law
   - 6.1 Overview of Relevant Laws
   - 6.2 Protection of Intellectual Property
   - 6.3 IT Contracts
   - 6.4 Privacy

Literature

Compulsory Reading

Further Reading

- Cervone, H. F. (2017). Implementing IT governance: A primer for informaticians. Digital Library Perspectives, 33(4), 282—287.

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Online Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☐ Guideline
☑ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☑ Exam Template	☑ Slides

Study Format myStudies

Study Format	Course Type
myStudies	Lecture

Information about the examination	
Examination Admission Requirements	**BOLK:** yes **Course Evaluation:** no
Type of Exam	Exam, 90 Minutes

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
90 h	0 h	30 h	30 h	0 h	150 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☑ Course Book	☐ Creative Lab
☐ Vodcast	☐ Guideline
☑ Shortcast	☐ Live Tutorium/Course Feed
☑ Audio	☐ Reader
☑ Exam Template	☑ Slides

Master Thesis

Module Code: DLMMTHES

Module Type	Admission Requirements	Study Level	CP	Student Workload
see curriculum	See current study and exam regulations (SPO)	MA	15	450 h

Semester / Term	Duration	Regularly offered in	Language of Instruction and Examination
2. Semester	Minimum 1 semester	WiSe/SoSe	English

Module Coordinator

Prof. Dr. Irina Tiemann (Master Thesis) / Prof. Dr. Irina Tiemann (Colloquium)

Contributing Courses to Module

- Master Thesis (DLMMTHES01)
- Colloquium (DLMMTHES02)

Module Exam Type

Module Exam

Split Exam

Master Thesis

- Study Format "Distance Learning": Written Assessment: Master Thesis (90)
- Study Format "myStudies": Written Assessment: Master Thesis (90)

Colloquium

- Study Format "myStudies": Presentation: Colloquium (10)
- Study Format "Distance Learning": Presentation: Colloquium (10)

Weight of Module

see curriculum

Module Contents

Master Thesis

- Written Master Thesis

Colloquium

- Thesis Defense

Learning Outcomes

Master Thesis

On successful completion, students will be able to

- work on a problem from their major field of study by applying the specialist and methodological skills they have acquired during their studies.
- analyse selected tasks with scientific methods, critically evaluate them and develop appropriate solutions under the guidance of an academic supervisor.
- record and analyse existing (research) literature appropriate to the topic of the Master's thesis.
- prepare a detailed written elaboration in compliance with scientific methods.

Colloquium

On successful completion, students will be able to

- present a problem from their field of study under consideration of academic presentation and communication techniques.
- reflect on the scientific and methodological approach chosen in the Master's thesis.
- actively answer subject-related questions from subject experts (experts of the Master's thesis).

Links to other Modules within the Study Program	Links to other Study Programs of the University
All modules in the master program	All Master Programmes

Master Thesis

Course Code: DLMMTHES01

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		13.5	See current study and exam regulations (SPO)

Course Description

The aim and purpose of the Master's thesis is to successfully apply the subject-specific and methodological competencies acquired during the course of study in the form of an academic dissertation with a thematic reference to the major field of study. The content of the Master's thesis can be a practical-empirical or theoretical-scientific problem. Students should prove that they can independently analyse a selected problem with scientific methods, critically evaluate it and work out proposed solutions under the subject-methodological guidance of an academic supervisor. The topic to be chosen by the student from the respective field of study should not only prove the acquired scientific competences, but should also deepen and round off the academic knowledge of the student in order to optimally align his professional abilities and skills with the needs of the future field of activity.

Course Outcomes

On successful completion, students will be able to

- work on a problem from their major field of study by applying the specialist and methodological skills they have acquired during their studies.
- analyse selected tasks with scientific methods, critically evaluate them and develop appropriate solutions under the guidance of an academic supervisor.
- record and analyse existing (research) literature appropriate to the topic of the Master's thesis.
- prepare a detailed written elaboration in compliance with scientific methods.

Contents

- Within the framework of the Master's thesis, the problem as well as the scientific research goal must be clearly emphasized. The work must reflect the current state of knowledge of the topic to be examined by means of an appropriate literature analysis. The student must prove his ability to use the acquired knowledge theoretically and/or empirically in the form of an independent and problem-solution-oriented application.

Literature
Compulsory Reading
Further Reading ▪ Bui, Y. N. (2013). How to Write a Master's Thesis (2nd ed.). SAGE Publications, Incorporated. ▪ Turabian, K. L. (2013). A Manual for Writers of Research Papers, theses, and dissertations (8th ed.). University of Chicago Press. ▪ Further subject specific literature

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Thesis

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Master Thesis

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
405 h	0 h	0 h	0 h	0 h	405 h

Instructional Methods

- ☐ Learning Sprints®
- ☐ Course Book
- ☐ Vodcast
- ☐ Shortcast
- ☐ Audio
- ☐ Exam Template
- ☐ Review Book
- ☐ Creative Lab
- ☑ Guideline
- ☐ Live Tutorium/Course Feed
- ☑ Slides

Study Format myStudies

Study Format	Course Type
myStudies	Thesis

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Written Assessment: Master Thesis

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
405 h	0 h	0 h	0 h	0 h	405 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

Colloquium

Course Code: DLMMTHES02

Study Level	Language of Instruction and Examination	Contact Hours	CP	Admission Requirements
MA	English		1.5	See current study and exam regulations (SPO)

Course Description

The colloquium will take place after submission of the Master's thesis. This is done at the invitation of the experts. During the colloquium, the students must prove that they have fully independently produced the content and results of the written work. The content of the colloquium is a presentation of the most important work contents and research results by the student, and the answering of questions by the experts.

Course Outcomes

On successful completion, students will be able to

- present a problem from their field of study under consideration of academic presentation and communication techniques.
- reflect on the scientific and methodological approach chosen in the Master's thesis.
- actively answer subject-related questions from subject experts (experts of the Master's thesis).

Contents

- The colloquium includes a presentation of the most important results of the Master's thesis, followed by the student answering the reviewers' technical questions.

Literature

Compulsory Reading

Further Reading

- Renz, K.-C. (2016): The 1 x 1 of the presentation. For school, study and work. 2nd edition, Springer Gabler, Wiesbaden.

Study Format myStudies

Study Format	Course Type
myStudies	Thesis Defense

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Presentation: Colloquium

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
45 h	0 h	0 h	0 h	0 h	45 h

Instructional Methods	
☐ Learning Sprints®	☐ Review Book
☐ Course Book	☐ Creative Lab
☐ Vodcast	☑ Guideline
☐ Shortcast	☐ Live Tutorium/Course Feed
☐ Audio	☑ Slides
☐ Exam Template	

Study Format Distance Learning

Study Format	Course Type
Distance Learning	Thesis Defense

Information about the examination	
Examination Admission Requirements	**BOLK:** no **Course Evaluation:** no
Type of Exam	Presentation: Colloquium

Student Workload					
Self Study	**Contact Hours**	**Tutorial**	**Self Test**	**Independent Study**	**Hours Total**
45 h	0 h	0 h	0 h	0 h	45 h

Instructional Methods

- ☐ Learning Sprints®
- ☐ Course Book
- ☐ Vodcast
- ☐ Shortcast
- ☐ Audio
- ☐ Exam Template
- ☐ Review Book
- ☐ Creative Lab
- ☑ Guideline
- ☐ Live Tutorium/Course Feed
- ☑ Slides