**Valid for** 2024.FS

| Module Name: Requirements Engineering | |
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| Module Code | w.BA.XX.3RE-WIN.XX |
| Module Description | Students know and understand the process of requirements engineering or requirements consolidation and are able to plan, organize, lead, and carry out associated activities. In particular, students understand the different methods of requirements engineering, different forms of requirements description and documentation, and the different quality criteria and types of requirements evaluation. They are familiar with the methods and tools used in the collection, description, evaluation, and testing of requirements and can apply these in a goal-oriented manner in the development of software and systems. This knowledge is relevant to the vocational fields of business analysis, requirements engineering, and IT project management. The module covers some of the content of the Certified Professional for Requirements Engineering exam (IREB Foundation Level). |
| Program and Specialization | § Business Information Technology - Specialization in Business Information Systems <br> § Business Information Technology - Specialization in Data Science |
| Legal Framework | Academic Regulations BSc dated 29.01.2009, for the degree programs in Business Administration, International Management, Business Information Technology, Business Law, Business Law and Applied Law, first adopted on 12.05.2009 |
| Module Category | **Module Type:** <br> Compulsory <br> **Program Phase:** <br> First-Year Studies |
| ECTS | 6 |
| Organizational Unit | W Institut für Wirtschaftsinformatik |
| Module Coordinator | Adrian Moser (mosa) |
| Deputy Module Coordinator | Alexandre de Spindler (desa) |
| Prerequisite Knowledge | - |
| Contribution to Program Learning Goals (Affected by Module) | § Professional Competence <br> § Methodological Competence <br> § Social Competence <br> § Self-Competence |
| Contribution to Program Learning Objectives | Professional Competence <br> § Knowing and Understanding Content of Theoretical and Practical Relevance <br> § Apply, Analyze, and Synthesize Content of Theoretical and Practical Relevance <br> § Evaluate Content of Theoretical and Practical Relevance <br> Methodological Competence <br> § Problem-Solving & Critical Thinking <br> § Scientific Methodology <br> § Work Methods, Techniques, and Procedures <br> § Information Literacy <br> Social Competence <br> § Written Communication <br> § Oral Communication <br> § Teamwork & Conflict Management <br> Self-Competence <br> § Learning & Change |
| Module Learning Objectives | Students... <br> § know the needs behind requirements engineering (motivation, people, profitability, and failure costs). <br> § know the roles of the business analyst and requirements engineer. <br> § understand the concept of stakeholders (interest group) and are able to identify, prioritize, understand, and communicate with them. <br> § understand the concepts of "system" and "actor". <br> § know requirement identification techniques and sources of requirements and can evaluate and select them according to the project environment. <br> § know the rules for natural language-based requirement specifications. <br> § know and recognize possible transformations when describing requirements using natural language. <br> § know and formulate structured forms of describing requirements using language (scenarios, user stories, sentence templates). <br> § know and formulate structured descriptions of requirements using UML (use case diagram and use case description). <br> § distinguish between systems and users in the use case diagram and are able to identify and define system boundaries as well as actors and their use cases. <br> § apply reusability (inheritance, include, extend) to the use case diagram. |

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| | § know different perspectives on requirements (actors, functional, behavior, data). |
| | § know and understand functional and non-functional requirements and assign requirements to the correct group. |
| | § know and understand the classification of requirements using the Kano model and use it to classify requirements. |
| | § know and understand requirements prioritization and are able to prioritize requirements. |
| | § know tools for eliciting, describing, and managing requirements. |
| | § describe data using a data model according to the Chen notation (ERM entity-relationship model), avoiding redundancy and ensuring data quality. |
| | § Know the basics of user interfaces and can create mockups and prototypes to match other requirements documents. |
| | § know user-centered design and can identify persona variables and create personas. |
| | § know basic and advanced elements of UML activity diagrams and can use them to capture processes. |
| | § know basic and advanced elements of UML state diagrams and can use them to describe the behavior of a system. |
| | § recognize conflicts between requirements (overlaps, sequence, costs, usability), and are able to classify and resolve them. |
| | § use the various description methods (language, UML, Chen) to describe requirements as completely and without contradictions as possible. |
| | § know possible test types and test concepts of software and can assign these test types in terms of content as well as time in the project flow. |
| | § check systems and software for compliance with requirements. |
| | § manage changes as well as configurations of requirements engineering results. |
| | § plan, execute, evaluate, and improve requirements engineering processes. |
| Module Content | § Basics of requirements engineering and business analysis, motivation, cost-effectiveness, and failure costs, approaches (waterfall vs. iterative), an overview of tools: language, UML, ER, mockups |
| | § Basic concepts & language, problem statement, stakeholders, roles, types of requirements (functional, non-functional, Kano model), language (transformations, scenarios, user stories, templates). |
| | § Use cases, capturing requirements: perspectives, introduction to use cases (actor, system), use cases (use case diagrams, use case descriptions, reuse) |
| | § Data modeling using Chen (ER model) |
| | § Mockups and wireframes, user interfaces, user-centered design, personas, styleguides, mockups, prototyping, evaluation |
| | § UML activity diagrams |
| | § UML state diagrams |
| | § Case study on the problem statement, actors, classification, use case diagram and use case descriptions, activity diagrams, state diagrams, ER model. |
| | § Requirements interactions and testing, conflicts and interactions, partitioning, traces, testing (DevOps, BlackBox, WhiteBox, unit, coverage) |
| | § Case study on user stories, ER model, prototyping, testing |
| | § The module covers some of the content of the Certified Professional for Requirements Engineering exam (IREB Foundation Level). |
| Links to other modules | The content of this module is linked to the following modules: |
| | w.BA.XX.3DM-WIN.XX |
| | w.BA.XX.3ITPM-WIN.XX |
| | w.BA.XX.3MDM-WIN.XX |
| | w.BA.XX.3Pt-WIN.XX |
| | w.BA.XX.3SE1-WIN.XX |
| | w.BA.XX.3SE2-WIN.XX |
| Methods of Instruction | § Lecture    **Social Settings Used:** |
| | § Interactive Instruction    § Individual Work |
| | § Application Tasks    § Group Work |
| | § Case Studies |
| | § Exercises |
| | § Problem-Oriented Teaching |
| | § Group project |
| Digital Resources | § Teaching Materials |
| | § Practice and Application Exercises (with Key) |
| | § Case Studies (with Key) |

| Type of Instruction | | Classroom Instruction | Guided Self-Study | Autonomous Self-Study |
|---|---|---|---|---|
| | Large Class | 28 h | - | |
| | Small Class | 28 h | 40 h | |
| | Group Instruction | - | - | |
| | Practical Work | - | - | |
| | Seminar | - | - | |
| | **Total** | **56 h** | **40 h** | **84 h** |

| Performance Assessment | | | | |
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| **End-of-module exam** | Form | | Length (min.) | Weighting |
| Written exam | Specified documentation | | 90 | 100,00 % |
| **Permitted Resources** | No calculator | | With dictionary | |
| | | | | |
| | **Others** | **Assessment** | **Length (min.)** | **Weighting** |
| | Exercises (all but two freely selectable exercises must be completed and submitted on time. Exercise 1 includes a presentation). | Pass/Fail | - | - |

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| Classroom Attendance Requirement | Mandatory Attendance: Other<br><br>Compulsory attendance in the small class: Semester weeks 1 and 2 (preparation and presentation). |
| Language of Instruction/Examination | German |
| Compulsory Reading | § Lecture slides and literature provided on Moodle (exercises, solution examples) |
| Recommended Reading | § Rupp, C. & SOPHISTen (2020). Requirements-Engineering und –Management - Das Handbuch für Anforderungen in jeder Situation. 7th edition. Carl Hanser Verlag GmbH & Co. KG. ISBN 978-3-446-45587-0.<br>§ Kecher, C., Hoffmann-Elbern, R. & Will, T. (2021). UML 2.5, Das umfassende Handbuch. 7th edition. Rheinwerk. ISBN 978-3-8362-8447-9. |
| Comments | • The lecture notes (scripts) are in German. Teaching materials are subject to change without notice.<br>• The exact number of exercises will be communicated in the first week of the semester and on Moodle. |