HAW Kiel
Hochschule für Angewandte Wissenschaften Kiel
Kiel University of Applied Sciences

MI137 - Advanced Software Engineering

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General information	
Module Code	MI137
Unique Identifier	
Module Leader(s)	Prof. Dr. Prochnow, Steffen (steffen.prochnow@haw-kiel.de)
Lecturer(s)	Prof. Dr. Prochnow, Steffen (steffen.prochnow@haw-kiel.de)
Offered in Semester	Sommersemester 2023
Module duration	1 Semester
Occurrence frequency	Regular
Module occurrence	In der Regel im Sommersemester
Language	Englisch
Recommended for international students	Yes
Can be attended with different study programme	Yes

Curricular relevance (according to examination regulations)

Study Subject: M.Sc. - MIE - Information Engineering (PO 2022, V3)
Module type: Wahlmodul
Semester: 1, 2, 3

Qualification outcome

Areas of Competence: Knowledge and Understanding; Use, application and generation of knowledge; Communication and cooperation; Scientific self-understanding / professionalism.

The Advanced Software Engineering course focuses on contemporary techniques for the development of software systems, with an emphasis on the construction and management large and secure software systems. The course will also equip you with essential research, analytical and critical thinking skills.

The course deals with the model-based specification of software systems and components as well as their verification, validation and quality assurance. The emphasis is on view-based specification methods that use multiple views, expressed in multiple languages, to describe orthogonal aspects of software systems/components. Key examples include structural views represented using class diagrams, operational views expressed using constraint languages and behavioural views expressed using state diagrams. An important focus of the course is the use of these views to define tests and extra-functional properties.

Students learn to:
- Analyze and assess the requirements for new or existing software applications and operating systems
- Design, develop, and test user-friendly software solutions in the field of user experience engineering
- Create specifications for, develop, implement, introduce, maintain, and refine complex software architectures and systems
- Evaluate, compare, plan, design, implement, and develop IT applications
- Plan, design, and carry out software tests
- Analyze, design, develop, implement, and test modern, user-friendly operating concepts and user interfaces
- dentify, analyze, and model complex issues and processes (on behalf of clients)
- Collaborate on, head, or supervise IT projects

Content information

Content	After taking the course, students will be familiar with the latest state-of-the-art techniques for specifying the externally visible properties of a software system/component – that is, for describing a software system/component as a 'black box'. Participants will also know how to use the expertise acquired during the course to describe the requirements that a system/component has to satisfy and to define tests to check whether a system/component fulfils these requirements. With the acquired skills and know-how, students will be able to play a key role in projects involving the development of systems, components and software applications. Topics: - Software Quality - Software Reliability - Distributed Software Engineering - Aspect-Oriented Software Engineering - Service Oriented Architecture - Release Engineering - Optimization and Performance
Literature	Somerville: Software Engineering. Ludewig, Lichter: Software Engineering. dpunkt.verlag. Shepperd, Ince: Derivation and Evaluation of Software Metrics, Claredon Press. Wohlin, et. Al: Experimentation in Software Engineering, Springer. Proceedings of the International Symposium on Search-Based Software Engineering

Teaching formats of the courses

Teaching format	SWS

Lehrvortrag	2
Projekt	2

Workload	
Number of SWS	4 SWS
Credits	5,00 Credits
Contact hours	48 Hours
Self study	102 Hours

Module Examination	
Examination prerequisites according to exam regulations	None
MI137 - Portfolioprüfung	Method of Examination: Portfolioprüfung Weighting: 100% wird angerechnet gem. § 11 Absatz 2 PVO: No Graded: Yes