D U A L E H O C H S C H U L E
Baden-Württemberg
Studienbereich Technik

Software Engineering – Implementation (MC2313)

Software Engineering I (isced-f/0613)

Modulbezeichnung	Sprache	Modulcode	Unit	Modulverantwortlicher; Standort
Software Engineering I		T4INF2003	6	Till Hänisch; HDH
Modulbezeichnung Englisch				
Software Engineering I				

Type of module
Microcredential

Teaching methods	
teaching forms	lecture, tutorial, lab work
teaching methods	lecture, discussion, group work

Form of examination	Exam duration (in min)	Graded
program design		Yes

Workload and ECTS			
total workload (in hours)	**of which interactive**	**of which self-study**	**ECTS-points**
90	32	58	3

Qualification goals and competences	
Professional competence	Students know the basics of the software development process (know technical designs, procedures, methods, tools or activities)
Methodical competence	The students are able to analyze a given problem statement (analyse business requirements) They can use tools for collaboration and problem-solving (using digital tools for collaboration, content creation and problem solving) (P) They can design and implement a computer-based solution (designing ict systems or applications) (P) They can make corrective adjustments to solution proposals (correcting design decisions) (P) They are familiar with the methods and supporting technologies of the respective project phases (ICT project management methodologies) (P) They can select and apply appropriate methods for specific problems. (P)
Personal and social competence	The students can competitively evaluate solution proposals for a given problem and justify their designs and solutions (analysing and evaluating ICT systems and solutions) (P)

	They can competitively assess, select, and critically reflect upon solution proposals for a given problem (P) The students can engage with domain experts in discussions about problem analyses and solution proposals, as well as about the interconnections of individual phases (P) They can orally and in writing present their designs and solutions (P) During the discussion, they can critically engage with various perspectives (P) They can build and further develop teams (P) They can select and apply appropriate methods for specific problems (P) (No 1:1 relation to ESCO-terms here, instead using these with similar meaning: negotiating, presenting information, working with others, building and developing teams) (P)
Interdisciplinary competence	They can independently familiarize themselves with tools. (P) They can recognize their own strengths and weaknesses in the project and strive for improvement. (P) They can handle conflicts and resolve them constructively. (P) They can pass on and support skills. (P) They can provide each other with constructive feedback. (P) The students can integrate interdisciplinary skills, such as combining the software development process with project management techniques and considering time and cost factors during the project. (P) (No 1:1 relation to ESCO-terms here, instead using these with similar meaning: Transversal skills T2+3+4 like planning and organizing, thinking creatively and innovatively, working efficiently, taking a proactive approach, accept criticism and guidance, communicating, supporting others) (P) They can effectively collaborate within a team in complex projects (collaborating in teams and networks) (P)

Contents
- Information and Communication Technologies - Project Management Methods (ICT project management methodologies) - Phases of Software Engineering and their Interconnections (systems development life-cycle) - Requirements Engineering and Use Cases (ICT system user requirements) - Analysis and Design Models (e.g., Modeling Techniques like UML or SADT) (object-oriented modelling) - Different types of documentation are addressed in phase-specific manner (provide technical documentation) ---------- - Requirements Management - Software Architectures, Interface Design, Software Design, and Design Patterns (software architecture models, designing ict systems or applications) - Version Control (tools for software configuration management) - Incorporation of Existing Software Libraries (software components libraries) - Software Development Environments (Integrated development environment software) ---------- - Coding guidelines and code quality and reviewing - Testing levels, planning, and assessment (levels of software testing) - Continuous Integration (continuous integration) (continuous integration) - Operation and Maintenance (solution deployment)

Prerequisites
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Literature
- Helmut Balzert: Lehrbuch der Softwaretechnik: Entwurf, Implementierung, Installation und Betrieb, Spektrum akademischer Verlag - Helmut Balzert: Lehrbuch der Softwaretechnik: Softwaremanagement, Spektrum akademischer Verlag - Ian Sommerville: Software Engineering, Pearson Studium - Chris Rupp: Requirements-Engineering und -Management: Aus der Praxis von klassisch bis agil, Carl Hanser Verlag GmbH & Co. KG

ESCO skill	URI
know technical designs, procedures, methods, tools or activities (S2.2.6+)	http://data.europa.eu/esco/skill/95bf4552-6d5b-41dc-b990-53ace372f705
ICT project management methodologies	http://data.europa.eu/esco/skill/bec4359e-cb92-468f-a997-8fb28e32fba9
analyse business requirements	http://data.europa.eu/esco/skill/b04f377b-ee80-4b38-aca1-19d266a23b17
designing ict systems or applications (S1.11.1)	http://data.europa.eu/esco/skill/b590d4e5-7c62-4b4a-abc2-c270b482e0ce
correcting design decisions (S.4.9+)	http://data.europa.eu/esco/skill/bb99a123-88be-42a2-8758-f5a18e06ccc6
using digital tools for collaboration, content creation and problem solving (S.5.6)	http://data.europa.eu/esco/skill/S5.6
analysing and evaluating ICT systems and solutions (S.2.7.6+)	http://data.europa.eu/esco/skill/f2cf57fe-d4cb-4b4a-831d-73171cc73909
negotiating (S.1.1)	http://data.europa.eu/esco/skill/323b3684-86ec-40fa-81b4-bc52694ef168
presenting information (S.1.4)	http://data.europa.eu/esco/skill/3f641516-9846-4a7f-a7f4-e1274eef6688
working with others (S.1.8)	http://data.europa.eu/esco/skill/548c3fbe-9eb1-4035-bc54-027fd5bc5315
building and developing teams (S.4.6)	http://data.europa.eu/esco/skill/2d02d98c-20c4-4b46-bf44-e5f85a3f03ed
ICT system user requirements (K.3.1)	http://data.europa.eu/esco/skill/ca73ac82-867a-4afa-9732-834aebe896ff
systems development life-cycle	http://data.europa.eu/esco/skill/09f2f811-a3fb-4de3-a70f-6420a6935575
information and Communications Technologies	http://data.europa.eu/esco/isced-f/061
object-oriented modelling	http://data.europa.eu/esco/skill/5be3d306-6cf1-4b49-aa1d-01651dd4ba4c
provide technical documentation	http://data.europa.eu/esco/skill/04dfd9fb-e0cf-40f6-96c6-9d2280c4347e
software architecture models	http://data.europa.eu/esco/skill/2450c3b3-e78e-435b-b84d-e05d984e71dc
designing ict systems or applications (S.1.11.1)	http://data.europa.eu/esco/skill/b590d4e5-7c62-4b4a-abc2-c270b482e0ce

tools for software configuration management	http://data.europa.eu/esco/skill/b590d4e5-7c62-4b4a-abc2-c270b482e0ce
continuous integration (isced-f/0613+)	
software components libraries	http://data.europa.eu/esco/skill/484df271-bb52-49f1-8f50-f19624bf4df2
integrated development environment software	http://data.europa.eu/esco/skill/925463a7-d51f-4d5b-9f79-4d28cf30acde
levels of software testing	http://data.europa.eu/esco/skill/85f46538-ae70-498a-bfbc-b8ddafe96c7d
solution deployment	http://data.europa.eu/esco/skill/1d86f05e-e9cc-40ce-99d8-2b21cc71b16b
planning and organizing (T2.2)	http://data.europa.eu/esco/skill/66fdc34c-2326-4baa-b8ff-7a1d1015fe3a
thinking creatively and innovatively (T2.4)	http://data.europa.eu/esco/skill/e84d080a-ff6d-41a7-b7b9-133e97c7bf00
working efficiently (T3.1)	http://data.europa.eu/esco/skill/14c41899-0224-4cbc-bd8c-e946ada2da87
taking a proactive approach (T3.2)	http://data.europa.eu/esco/skill/91860993-1a8b-4473-91f3-600aa1924bd0
accept criticism and guidance (T3.4)	http://data.europa.eu/esco/skill/05aa7c09-46e7-433f-a81b-92841f4551e7
Communicating (T4.1)	http://data.europa.eu/esco/skill/6f142deb-03a9-4cd7-94ce-e0f023ae2169
supporting others (T4.2)	http://data.europa.eu/esco/skill/82463bb1-85d1-4e99-a4ce-08508fc3b2a3
organising, planning and scheduling work and activities	http://data.europa.eu/esco/skill/S4.2.0