



CODE / DESIGN / ENTREPRENEURSHIP
UNIVERSITY OF APPLIED SCIENCES
BERLIN

Study and Examination Regulations for the Bachelor Program in Software Engineering

CODE University of Applied Sciences
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§ 1 Scope of Application

- (1) These Study and Examination Regulations apply to students of the bachelor's degree program Software Engineering. They supplement the Study and Examination Regulations (SER) of CODE University of Applied Sciences and regulate the objectives, content, and structure of the bachelor's program in Software Engineering. The admission requirements are regulated in the General Regulations for Admissions and Enrollment.

§ 2 Start and Termination of Regulations

- (1) These regulations shall enter into force with the beginning of the fall semester on August 1, 2023.
- (2) The previously valid study and examination regulations for the Bachelor's degree program Software Engineering will expire ten semesters after these regulations come into force. Students who have not yet completed their studies according to the previously valid regulations at this time will automatically be transferred to the present regulations. The Board of Examiners decides on the recognition of the previously completed study achievements.

§ 3 Qualification Objectives

- (1) The aim of the bachelor's degree program is to provide a comprehensive scientific and practical qualification for software developers. Typical job profiles are web and app developers, backend or database developers, as well as machine learning engineers, data scientists, IT consultants or application architects. The focus is on competences that are necessary for the design, implementation, testing, evaluation, and operation of tailor-made software solutions and the application of digital solution strategies. Graduates of the program should be able to identify suitable technologies in the field of software engineering and utilize them for the best possible human-machine interaction. They will work both alone and as part of interdisciplinary teams to address societal challenges and contribute to problem solving.
- (2) Theoretical and methodological foundations are, alongside practical knowledge and key qualifications, equally important qualification goals of the program. Students should

also be qualified to engage in civil society. The modules and competence goals of the Science, Technology and Society Program also contribute to this.

- (3) Graduates of the program know how to reflect on and develop their own competences in accordance with specific requirements. After completing their studies, they have in-depth reflection, social, professional and communication skills. Graduates have mastered the principles of scientific thinking and working and will be able to communicate and collaborate with various actors in the context of digital product development.

§ 4 Standard Duration and Scope of Study

- (1) The standard duration of study is six semesters. One semester is equivalent to six months and two semesters are equivalent to one academic year. According to § 7 of the SER, 30 credit points (CPs) can be achieved per semester, corresponding to a workload of 900 working hours. This results in a total of 180 credit points over six semesters and corresponds to an average total working time of 5,400 hours.

§ 5 Academic Degree

- (1) The academic degree Bachelor of Science (B. Sc.) is awarded in the Software Engineering program after successfully passing the bachelor assessment.

§ 6 Structure and Organization

- (1) The bachelor's program in Software Engineering is divided into the orientation (first) semester, usually four core semesters, and the synthesis (sixth) semester.
- (2) The orientation semester is identical to that of the bachelor's programs in Interaction Design and Product Management. This enables students to transfer to one of the other two Bachelor programs at the end of the orientation semester with full credit recognition for the work performed.
- (3) The semesters are structured by mandatory, elective and compulsory elective modules (§§ 7 and 8). Modules may extend over several semesters due to content or procedural

reasons. The following module overview shows the individual modules and competences of the study program as well as its progression:

Module Overview Bachelor of Science (B. Sc.) in Software Engineering						
Module	Title	Mandatory	Semester	SWS	CPs	Grading ¹
OS_01	Introduction to Software Engineering	X	1	2	5	-
OS_02	Introduction to Interaction Design	X	1	2	5	-
OS_03	Introduction to Product Management	X	1	2	5	-
OS_05	Application of Project-Based Learning Methods	X	1	4	9	-
STS_01	STS Essentials	X	1	2	6	X
SE_01	Software Development Basics		2 - 5	2	5	-
SE_02	Algorithms and Data Structures	X	2 - 5	2	5	X
SE_03	Concepts of Programming Languages	X	2 - 5	2	5	X
SE_04	Network Programming		2 - 5	2	5	X
SE_05	Relational Databases	(X) ²	2 - 5	2	5	X
SE_06	NoSQL Databases	(X)	2 - 5	2	5	X
SE_07	Technical Documentation	X	2 - 5	2	5	X
SE_08	Clean Code	X	2 - 5	2	5	X
SE_09	Cyber Security	X	2 - 5	2	5	X
SE_10	Automated Software Testing	X	2 - 5	2	5	X
SE_14	Artificial Intelligence Basics		2 - 5	2	5	-
SE_15	Machine Learning		2 - 5	2	5	X
SE_19	Web Technologies Basics		2 - 5	2	5	-
SE_23	Continuous Delivery and Operations		2 - 5	2	5	X
SE_24	Distributed and Parallel Computing		2 - 5	2	5	X
SE_28	Linear Algebra		2 - 5	2	5	X
SE_29	Multivariate Calculus		2 - 5	2	5	X
SE_30	Probability and Statistics		2 - 5	2	5	X
SE_31	Applied Scientific Research		2 - 5	2	5	-

¹ Grading standards are defined in the SER; X = graded, - = pass/fail.

² (X) denotes a compulsory elective module, see § 7 for details.

SE_35	Software Modeling and Design Patterns		2 - 5	2	5	X
SE_37	Optimization in Artificial Intelligence		2 - 5	2	5	X
SE_38	Planning in Artificial Intelligence		2 - 5	2	5	X
SE_39	Publishing a Research Paper		2 - 5	2	5	X
SE_40	Essential Mathematical Methods		2 - 5	2	5	X
SE_41	Digital Fabrication		2 - 5	2	5	X
SE_42	Data Science Basics		2 - 5	2	5	-
SE_43	Data Science		2 - 5	4	10	X
SE_44	Embedded Development		2 - 5	4	10	X
SE_45	Web Frontend Technologies		2 - 5	4	10	X
SE_46	Web Backend Technologies		2 - 5	4	10	X
SE_47	Mobile App Development		2 - 5	4	10	X
SE_48	Cloud Computing		2 - 5	4	10	X
SE_49	Blockchain		2 - 5	4	10	X
SE_51	Software Engineering Specialty		2 - 5	2	5	X
SE_52	Software Engineering Specialty		2 - 5	2	5	X
SE_53	Software Engineering Specialty		2 - 5	2	5	X
SE_54	Software Engineering Specialty		2 - 5	4	10	X
SE_55	Software Engineering Specialty		2 - 5	4	10	X
SE_56	Software Engineering Specialty		2 - 5	4	10	X
STS_02	Academic Reading	X	2 - 5	2	5	X
STS_03	Research	X	2 - 5	2	5	X
STS_04	Presentation	X	2 - 5	2	5	X
STS_05	Judging Technology	X	2 - 5	2	5	X
STS_06	Sustainable and Regenerative Development		2 - 5	2	5	X
STS_07	Self-Directed Learning		2 - 5	2	5	X
PM_24	Agile Ways of Working	(X)	2 - 5	4	10	X
PM_27	Teamwork and Collaboration	(X)	2 - 5	4	10	X
PM_28	Leadership	(X)	2 - 5	4	10	X
BA_01	Capstone Project	X	6	0	15	X
BA_02	Bachelor Thesis	X	6	0	15	X

§ 7 Mandatory Modules

- (1) Mandatory modules, with the exception of those in the orientation and synthesis semesters, can be completed in any order in one of the four core semesters. In applicable cases, this is restricted by the respective module description in the module handbook.
- (2) Mandatory modules in the bachelor's program in Software Engineering are:
 1. All modules in the orientation (first) semester:
 - Introduction to Interaction Design (5 CPs)
 - Introduction to Product Management (5 CPs)
 - Introduction to Software Engineering (5 CPs)
 - Application of Project-Based Learning Methods (9 CPs)
 - STS Essentials (6 CPs)
 2. The following modules in the core semesters:
 - Algorithms and Data Structures (5 CPs)
 - Concepts of Programming Languages (5 CPs)
 - Technical Documentation (5 CPs)
 - Clean Code (5 CPs)
 - Cyber Security (5 CPs)
 - Automated Software Testing (5 CPs)
 3. The following STS modules in the core semesters:
 - Academic Reading (5 CPs)
 - Research (5 CPs)
 - Presentation (5 CPs)
 - Judging Technology (5 CPs)
 4. All modules in the synthesis (sixth) semester:
 - Capstone Project (15 CPs)
 - Bachelor Thesis (15 CPs)

§ 8 Compulsory Elective and Elective Modules

- (1) 15 credit points must be earned through compulsory elective modules.
- (2) A compulsory elective is a module chosen from an approved subset of elective modules (see § 6). At a minimum, the specified number of credit points under paragraph 1 must be earned by completing compulsory elective modules.
 1. At least 5 credit points must be acquired from one of the following Software Engineering modules:
 - Relational Databases (5 CPs)
 - NoSQL Databases (5 CPs)
 2. At least 10 credit points must be acquired from one of the following modules:
 - Teamwork and Collaboration (10 CPs)
 - Leadership (10 CPs)
 - Agile Ways of Working (10 CPs)
- (3) 55 credit points must be earned through elective modules.
- (4) Elective modules can be selected from the range of electives offered in the Software Engineering program as well as from the entire range of Interaction Design, Product Management, and Science, Technology, and Society modules.

§ 9 Bachelor Thesis and Capstone Project

- (5) The Bachelor Thesis consists of a written submission and a colloquium. Both parts of the Bachelor Thesis must be passed separately. Only those who have passed the written part of the Bachelor Thesis are admitted to the colloquium. The duration of the colloquium must not be less than 20 minutes or more than 30 minutes.
- (6) Students may submit a proposal for a topic in the written part of the Bachelor Thesis. At the request of students, the Board of Examiners assigns a topic for the Bachelor Thesis. The topic of the Bachelor Thesis and the time at which the topic for the Bachelor Thesis was decided must be recorded. The topic, task, and scope of the Bachelor Thesis must be limited by the supervisor in such a way that the deadline for completing the written part of the Bachelor Thesis can be adhered to.

- (3) The Bachelor Thesis is supervised by a lecturer in the relevant subject area. The Bachelor Thesis is evaluated by the supervisor and another examiner, usually the primary examiner is the supervisor. The grade of the written part of the Bachelor Thesis results from the mathematical average of the evaluation of the first and second assessors. Separate evaluation sheets must be used for the evaluation. If the written part of the Bachelor Thesis has been assessed as "insufficient" by one of the two examiners, or if the grades differ by at least two (2.0) grades (e. g. 1.0 and 3.0, or 1.7 and 4.0, see § 14 SER), a further assessment and evaluation must be carried out by a third examiner. The final mark is the mathematical average of the grades of the three examiners. Should the arithmetic mean be greater than 4.0, the examination will be graded as "failed" (5.0).
- (4) The colloquium (oral examination) is usually conducted by the examiners who evaluated the written part of the Bachelor thesis. The grade of the colloquium is determined by mutual agreement of both examiners. If no agreement can be reached, the matter will be submitted to the Board of Examiners for consultation and further decision.
- (5) The final grade of the bachelor thesis is a combination of the grade of the written work, which accounts for 80% of the final grade, and the grade of the colloquium, which accounts for 20% of the final grade.
- (6) When registering for the Capstone Project, the student chooses an examination format according to § 12 SER. The duration of oral examinations in the Capstone Project module according to § 13 (1) SER can be a minimum of 15 minutes and extended up to 50 minutes in agreement with the student.

§ 10 Formation of the Final Grade

- (1) Final grades are calculated as follows: with the exception of the Bachelor Thesis and Capstone Project modules, all graded modules are weighted depending on their number of ECTS credit points and are included in the final grade. The Bachelor Thesis and Capstone Project modules are weighted three times their ECTS credit points. The examination office provides students with a formula for calculating the overall grade.

§ 11 Recognition of Prior Learnings

- (1) When a prior learning is recognized, the number of credits awarded is determined on a case-by-case basis. Prior learnings will be awarded credits in accordance with the respective CODE study program-specific regulations and grading. If the prior learning is graded and the grade comes from a scale that can be mapped to the grading scale outlined in § 14 of the SER, this grade will be adopted. Grades from other scales are converted (the modified "Bavarian formula" is used in such cases). However, conversion is not always possible. Grade conversions are determined by the Board of Examiners. Grades in this context will not be assigned a competency level (see § 14 SER).

Appendices

1. Sample Software Engineering Study Plan
2. Module Handbook