Study and examination regulations

for the bachelor's degree programme

B.Sc. Cybersecurity

at Deggendorf Institute of Technology

dated 1st October 2022

Based on Art. 13 (2) Clause 2, 58 (1), 61 (2) Clause 1 of the Bavarian Higher Education Act (BayHSChG) of 23 May 2006 (GVBl. p. 245, BayRS 2210-1-1-WK), last amended by Section 2 of the law dated 23 December 2021 (GVBl. p. 669), Deggendorf Institute of Technology enacts the following by-laws:

Section 1
Aim of the study programme

(1) The basic knowledge and skills relating to the most important subfields of informatics that are necessary in practical applications will be acquired on a scientific basis.

(2) [1]Comprehensive instruction will enable the students to recognise the essential interrelations within the topic cluster of cybersecurity. [2]Students taking the course will be able to process complex projects in cybersecurity independently and in teams, as well as to respond in an agile manner to rapidly advancing technical developments. [3]They will be able to recognize the impacts of system networking on the most varied areas, and to evaluate the opportunities and risks arising out of them.

(3) [1]The graduates will be able to decide on the appropriate use of security mechanisms (hardening, protection) in order to secure IT-systems. [2]They will learn methods for the prevention, detection and analysis of cyber incidents, and will be capable of applying them and adapting them to suit specific areas of application. [3]They will be able to create risk assessments independently and to audit IT-systems.

(4) [1]Students will enhance their technical knowledge and will study specialisations on the basis of compulsory elective modules which contribute to flexibility in designing individualized course biographies. [2]After completing the course, they will be in a position to work as cybersecurity experts on innovative problems within interdisciplinary teams in areas such as mobility, industry and production, building automation,

ecoinformatics or medical technology.

(5) [1]The graduates will be qualified to process application-oriented or research-oriented tasks and projects in a thorough and largely independent manner. [2]They will have learnt how to define goals, to employ the means suitable to achieve them, to access knowledge independently and, furthermore, how to evaluate the possible social, economic, ecological and ethical impacts of their activities in a systematic and critical manner, and to incorporate these factors conscientiously into their activities.

(6) [1]In addition to technical knowledge, the students will also acquire, on the basis of key qualifications, the social and methodological skills necessary for the development of their personalities, for working methodologies and personal organization, as well as for project planning and execution. [2]The students will learn methods for the organisation and development of innovations. [3]They will have created detailed project plans and will be able to evaluate the workload required to undertake the project. [3]These skills will enable the graduates to acclimatise quickly to roles which have both personnel and project responsibilities.

(7) [1]Career opportunities are available not only in commercial and utility companies, but also in public sector administration and in the private sector. [2]Emphasis is placed on wide-ranging and qualified instruction, which will enable the students to work in a variety of professions.

Section 2
Admission requirements

[1]The general admission requirements for studying at a university in accordance with Art. 43, 45 of the Bavarian Universities and Colleges Act (BayHSChG), in conjunction with the Ordinance on the Qualification for Studying at Universities in the Free State of Bavaria and at state-recognised, non-state governed universities (Qualifikationsverordnung-QualV) (BayRS 2210-1-1- 3-UK/WFK) in the respective amended versions, must be met for the Bachelor's programme in Cybersecurity.

Section 3
Course structure, standard period of study

(1) [1]The standard period of study for the programme is seven semesters, with six theory semesters and one practical semester. [2]The fifth semester is treated as the practical study semester.

(2) A total of 210 ECTS credits have to be obtained.

Section 4
Modules

(1) [1]The course is modular in structure. [2]The programme is comprised of modules which may be composed of thematically-related courses. [3]ECTS credits are assigned to each module. These credits take into account the time required by the students to complete the module.

(2) [1]Compulsory modules consist of courses that are compulsory for all students. [2]Compulsory elective modules must be attended by students (compulsory). However, students can select from among several optional modules (selectable). [3]This means that compulsory elective modules are modules that are offered as alternatives individually or in groups. [4]Students are required to select certain course modules in accordance with the study and examination regulations. [5]Selected modules are treated as compulsory modules.

(3) [1]The compulsory modules and compulsory elective modules, the teaching method, the number of teaching hours, the examinations and the corresponding ECTS credits are defined in the annex to these regulations. [2]The regulations are supplemented by the curriculum for the general and subject-specific compulsory elective modules.

(4) All the modules consist of compulsory modules, compulsory elective modules or optional modules:
1. Examinations for the module courses will be individual or for a module as a whole.
2. The total hours and the total ECTS credits of the compulsory elective modules may not be exceeded.
3. [1]Optional modules are modules that are not mandatory for achieving the study objective. [2]Students can additionally choose these from the courses offered by the university.

(5) Modules can also be taught in blocks.

(6) [1]No claim shall exist that all scheduled compulsory elective modules and optional modules will actually be offered. [2]Likewise, no claim shall exist that the relevant courses will be held if the number of participants is insufficient.

(7) In addition, lectures may also be offered in English.

Section 5
Minimum ECTS score requirement (GOP)

By the end of the second semester, students must have taken examinations in the following modules for the first time:
- Mathematics 1
- Programming 1
- Basics of Information Security.

Section 6
Curriculum

[1]The responsible faculty draws up a curriculum to safeguard the range of courses and to inform the students. Details of the course of studies are derived from this curriculum. [2]The curriculum will be decided by the Faculty Council and announced publicly within the university before the semester begins. [3]Changes or new regulations will be announced at the latest before the start of the lecture period of the semester in which these changes are to be implemented for the first time.

(1)   In particular, the curriculum contains regulations and information regarding:
   1.   the time distribution of weekly semester hours per module and semester including ECTS credits,
   2.   the description of the main subjects offered and their compulsory and elective modules, as well as the number of hours, type of course, study objectives and course content of these modules,
   3.   subject-specific elective modules with their number of hours,
   4.   the form of teaching in the individual modules, if they have not been definitively set out in the annex,
   5.   the study objectives and course content of individual modules (module handbook),
   6.   the goals and contents of practical work and the courses accompanying the internships in the practical semester, as well as their form and organisation.

(2)   The curriculum will include an internship.

Section 7
Admission to the internship

[1]Completion of internships and assignments in the 3rd semester, especially in the modules Network Security and Cryptology 2 in the 4th semester, requires basic prior knowledge. [2]Therefore, only those students who obtain a minimum of 40 ECTS credit points, and have passed at least two Minimum ECTS score requirement (GOP) (cf. Section 5), will be eligible to take these modules.

Section 8
Eligibility for the practical semester

(1)   [1]The practical semester of the course comprises at least 20 weeks and consists of an internship at a company, as well as courses accompanying the internship in accordance with the curriculum, which will be conducted as block events at the beginning and/or at the end of the semester. [2]In duly justified exceptional cases, proof of practical activity can be substituted by relevant subject-related practical training. [3]The internship in the practical semester can also be completed abroad.

(2)   Admission to the practical study semester requires a minimum of 70 ECTS credits.

Section 9
Specialised student advisory service

Students who have not yet acquired 30 ECTS credits from the modules 01 to 12 after two semesters are obliged to consult the student advisory service and there present an action plan as to how the student proposes to approach further studies.

Section 10
Assessment of examination performance

(1) For successfully completed examinations, ECTS credits will be awarded in accordance with the annex.

(2) [1]The overall examination grade is calculated by taking the weighted arithmetic mean of the individual grades. [2]Here, the weightage assigned to an individual grade is equal to the number of ECTS credits that have been assigned to the course for which the grade has been awarded.

(3) In addition to the overall examination grade in accordance with Para. 2, a relative grade based on the numerical value attained is shown according to the ECTS user guide as per regulations contained in Section 8 Para. 6 of the general examination regulations of Deggendorf Institute of Technology.

Section 11
Bachelor's thesis

(1) In the bachelor's thesis, students should demonstrate their ability to independently apply the knowledge and skills, which they have acquired during their studies, to complex tasks.

(2) Anyone who has successfully completed the modules for the Minimum ECTS score requirement (GOP) and has acquired a minimum of 120 ECTS credits can register for the bachelor's thesis.

(3) [1]The bachelor's thesis can be written in English or German. [2]The topics will be specified by faculty professors.

(4) The bachelor's thesis must be prepared within 6 months.

(5) [1]During the final thesis, a colloquium will be organised in the form of a seminar (oral presentation). [2]Students will have to defend their thesis during the colloquium.

Section 12
Certificate

A certificate of the passed bachelor's examination is issued in accordance with the respective sample in the annex to the general examination regulations of Deggendorf Institute of Technology.

Section 13
Academic degree and diploma supplement

(1) Upon successful completion of the bachelor's examination, the academic degree of "Bachelor of Science", abbreviated as "B.Sc.", will be awarded.

(2) A certificate granting the academic degree is issued in accordance with the respective sample in the annex to the general examination regulations of Deggendorf Institute of Technology.

(3) [1]The certificate is bilingual. [2]Moreover, a diploma supplement, which describes in particular the essential course content underlying the degree, the course of studies and the qualification obtained with the degree, will also be included.

Section 14
Applicability of RaPO, APO etc.

Insofar as no regulations have been laid down in these study and examination regulations, the relevant provisions of the state examination regulations for universities of applied sciences (RaPO) and the general examination regulations (APO) of Deggendorf Institute of Technology shall apply, in their respective latest version.

Section 15
Coming into effect

These study and examination regulations enter into force on 1st October 2022.

Annex 1
to the study and examination regulations for the bachelor's degree programme (B.Sc.) Cybersecurity at Deggendorf Institute of Technology

Overview of the modules

		Bachelor's programme Cybersecurity	Weekly semester hours (SWS)								ECTS per course	ECTS	Form of teaching	Examinations	
			SWS	Sem. 1	Sem. 1	Sem. 1	Sem. 1	Sem. 1	Sem. 1	Sem. 1				Prerequisites for admission	Type of examination
Module	Course	**Module/**co													
B-CY-01		**Mathematics 1**	4	4								5	SU/Ü	-	schrP
B-CY-02		**Programming 1**	4	4								5	SU/Ü	ÜbL	schrP
B-CY-03		**Basics of Computer Science**	4	4								5	SU/Ü	ÜbL	schrP
B-CY-04		**Operating Systems and Networks**	4	4								5	SU/Ü	-	schrP
B-CY-05		**Fundamentals of Information Security**	4	4								5	SU/Ü	-	schrP
B-CY-06		**Key Qualification 1**	4	4								5	SU/Ü	-	schrP
B-CY-07		**Mathematics 2**	4		4							5	SU/Ü	-	schrP
B-CY-08		**Programming 2**	4		4							5	SU/Ü	ÜbL	schrP
B-CY-09		**Algorithms and Data Structures**	4		4							5	SU/Ü	ÜbL	schrP
B-CY-10		**Internet Technologies**	4		4							5	SU/Ü	-	PoP
B-CY-11		**Cryptology 1**	4		4							5	SU/Ü/Pr	PrL	schrP
B-CY-12		**Key Qualification 2**	4		4							5	SU/Ü	-	schrP
B-CY-13		**Databases**	4			4						5	SU/Ü	-	schrP
B-CY-14		**Stochastics**	4			4						5	SU/Ü	-	schrP
B-CY-15		**Project Management**	4			4						5	SU/Ü	ÜbL	schrP
B-CY-16		**Secure Programming**	4			4						5	SU/U	-	PrA
B-CY-17		**Network Security**	4			4						5	SU/Ü/Pr	PrL	schrP
B-CY-18		**Key Qualification 3**	4			4						5	SU/Ü	-	PrA

Module	Course no.	Module/co	SWS	Sem. 1	Sem. 1	Sem. 1	Sem. 1	Sem. 1	Sem. 1	Sem. 1	ECTS per course	ECTS	Form of instruction	Prerequisites for admission	Type of examination
		Bachelor's programme Cybersecurity												**Examinations**	
B-CY-19		**Software Engineering**	4				4					5	SU/Ü	-	PrA
B-CY-20		**Compulsory Elective Module**	4				4					5	SU/Ü	-	PrA
B-CY-21		**Cryptology 2**	4				4					5	SU/Ü/Pr	Pr	PrA
B-CY-22		**Management of IT Security**	4				4					5	SU/Ü	-	PrA
B-CY-23		**Distributed Ledger Technologies**	4				4					5	SU/Ü	-	schrP
B-CY-24		**Key Qualification 4**	4				4					5	SU/Ü	-	schrP
B-CY-25		**Practical Module**						x				3			
	B-CY-5101	Internship						x			24		PP		
	B-CY-5102	Practical Seminar						2			3		Sem	-	PrB
	B-CY-5103	Complementary Practical Course						2			3		SU/Ü	U	-
B-CY-26		**Penetration Testing**	4						4			5	SU/Ü/Pr	Pr	PrA
B-CY-27		**Digital Forensics**	4						4			5	SU/Ü/Pr	Pr	PrA
B-CY-28		**Security of Interactive Systems**	4						4			5	SU/Ü	-	PrA
B-CY-29		**Security Engineering**	4						4			5	SU/Ü	-	PrA
B-CY-30		**Compulsory Elective Module 1**	4						4			5	SU/Ü		[1]
B-CY-31		**Key Qualification 5**	4						4			5	SU/Ü	-	PoP
B-CY-32		**Auditing of IT Systems**	4							4		5	SU/Ü	-	PrA-
B-CY-33		**Compulsory Elective Module 2**	4							4		5	SU/Ü		[1]
B-CY-34		**Compulsory Elective Module 3**	4							4		5	SU/Ü		[1]
B-CY-35		**Bachelor's Module**								x		1			
	B-CY-7101	Bachelor's Thesis								x	12		BA	-	BA
	B-CY-7102	Bachelor's Seminar								2	3		Sem	-	Kol
		Total SWS	138	24	24	24	24	4	24	14					
		Total ECTS	210	30	30	30	30	30	30	30					

[1] According to the study regulations of the selected module

Annex 2
to the study and examination regulations for the bachelor's degree programme (Bachelor of Science, B.Sc.) Cybersecurity at Deggendorf Institute of Technology

Overview of the types of courses

Types of courses:		
SU/Ü	Tuition in seminars along with exercises	Interactive form of teaching with active involvement of the student, in the form of discussions, assignments and practical work, e.g., group work, case studies.
Pr	Internship	Interactive form of instruction with the active participation of the students in the form of practical tasks that are to be carried out, e.g., experiments.
PP	Practical phase	The teaching method which is normally employed in a company or at another training institution for professional practical experience outside the university or college. The course and contents of the practical phase will be regulated by the University or coordinated with it.
Sem	Seminar	Small-scale course with a significant but variously active number of participants with the following characteristics: (1) Participants undertake a significant amount of active formation, while the lecturer guides, steers, assigns tasks, corrects, etc. (2) The participants actively form and present solutions to tasks or present their own work, or the work of others (3) Intensive interaction between the lecturer and the participants.

Annex 3
to the study and examination regulations for the Bachelor programme (Bachelor of Science, B.Sc.) Cybersecurity at Deggendorf Institute of Technology

Overview of the eligibility criteria for examinations

Eligibility criteria for examinations:			
PrL	Internship performance	written oral practical	The skill profile that is aimed at will be tested in an internship depending on the technical discipline, by means of experiments, programming tasks, etc. Internships are meant especially for practical application, evaluation and learning the theoretical basics in a module. Experiments during internships can be supplemented by a written detailed exposition. The concrete components of a internship and the skills that are to be tested by it are listed in the module description . The number of practical credits can be up to 10.
ÜbL	Assignments	written oral practical	The assignments check the skill profile aimed at by working through assigned tasks (such as laboratory assignments, simulations, assignment tasks, processing of case studies, context specific queries). They are used to test both factual knowledge and detailed knowledge and how these are applied. Assignments can be completed in written, oral or electronic form. The concrete components of the respective assignment and the skills that are to be tested by it are listed in the module description. The number of assignments can be up to 10.

Annex 4
to the study and examination regulations for the Bachelor programme (Bachelor of Science, B.Sc.) Cybersecurity at Deggendorf Institute of Technology

Overview of the forms of examination

Forms of examination:			
schrP	Written exam	written	Written form of examination for testing a desired skill profile within a specified time frame, with the specified tools and under supervision. It can also be carried out as an online examination. It usually lasts for 90 minutes for a module examination.
PrA	Project work	written oral practical	The desired skill profile will be tested by means of a project with a specified task assigned, which must be completed within a defined time in several phases and using suitable instruments. The project work is normally group work in which several students work on a common task that is assigned to them, and who then present the results orally and/or in writing. Each student is required to contribute individually to the joint assigned task. The oral presentation will last for 10 – 20 minutes, while the written part will comprise about 5–25 pages. The written part of the programming tasks, design projects, etc., will comprise 3–10 pages.
PoP	Portfolio examination	written oral pract.	The portfolio examination is a form of module examination that particularly pursues the goal of competency-oriented examination. This examination type is a summarised presentation of performances delivered continuously and in various forms as part of a module. Skills are not assessed on the basis of a single performance, but on the basis of several partial performances delivered during the semester. 2-6 partial performances can be offered as a portfolio examination. It is possible to choose a combination of the forms of examination mentioned so far and described in the following catalogue. These partial performances are to be announced in writing in the curriculum at the beginning of the module.

Essay	Short and independently written essay on a sub-topic of the module
Case study	Working on an assigned or self-selected practical case with appropriate (scientific) methods Expert interview
Interview with the aim of gaining insights into practice, including writing down the outcomes	
Learning journal	Independent documentation of one's own learning progress based on individual learning goals Bibliography
	Compilation of essential literature on a key topic of the module including an annotation Short test Written
processing of tasks for the understanding of module content, analogue or digital	
Report	Independent written or multimedia documentation of the contents of a course, an internship, an excursion etc. Short oral examination
	Oral answering of questions for the understanding of module contents, in person or via video conference
Short presentation	Oral presentation, live or recorded, optionally with written composition/thesis paper
Practical exercise	Practical exercise typical of the respective subject (e.g., programming, behavioural exercise in the form of role play, experiment, demonstration lesson, multimedia project, data analysis, drawing, or similar) incl. documentation (written and/or multimedia), if applicable
Text analysis	Examination of a given text with regard to certain aspects Position statement
	Analytical discussion of an issue, written or oral
Contribution to discussion	Professionally sound argumentation of a specific position within the framework of a structured exchange, e.g., on a discussion forum, in writing or orally Poster
	Visual presentation in the form of a poster to document a specific issue or project
Study sketch	Written composition of a scientific question and a research design
Peer feedback	Assessment of an assignment submitted by fellow students according to specified assessment criteria, in writing or orally
Concept paper/draft	Presentation of a concept in the form of texts, drawings, graphics, models or calculations for a concrete service or result to be developed
~~Excerpt~~	~~Independently prepared written extract from a text or short compilation of the most important thoughts of a given text for answering one (or more) questions~~
Self-reflection	Written, final critical assessment of one's performances and of competency acquisition within the module, as well as the analytical examination of one's own learning methods

PrB	Internship report	written	The internship report is a written work which serves to evaluate the internship phase that was completed outside the university, with reference to the university course. This comprises a maximum of 20 pages.
BA	Bachelor's thesis	written	The aim of the written, final thesis in the bachelor's programme is to provide evidence that the student is able to work on a task arising from his course work, within a specified period of time, independently and based on scientific methods: Maximum preparation period (time between registration for the bachelor thesis and submission) of 6 months/extent 50–70 pages. The thesis can be supplemented by an appendix, if necessary. The effort that is required (workload) is derived from the ECTS credit points awarded.
Kol	Colloquium	oral	The colloquium is an oral test lasting 10–30 minutes, in which the student defends the results of his concluding thesis.

Issued based on the resolution of the Senate of Deggendorf Institute of Technology dated 06 July 2022 and the regulatory approval of the Vice President of Deggendorf Institute of Technology dated 1 October 2022.

Signed by
Prof. Waldemar
Berg, Vice President

These by-laws were laid down on 01 October 2022 at Deggendorf Institute of Technology. This was announced by means of a notice on 01 October 2022. Day of announcement is therefore 01 October 2022.