



Curriculum for the Master's Degree Programme

Biotechnology

Curriculum 2024

This curriculum was approved by the Senate of the University of Graz at the meeting of 22 May 2024, and by the Senate of Graz University of Technology at the meeting of 27 May 2024.

The Master's Degree Programme Biotechnology is a jointly offered degree programme (§ 51e Universities Act 2002) of the University of Graz (Uni Graz) and Graz University of Technology (TU Graz) within the framework of "NAWI Graz" and based on the specifications and guidelines applicable to the NAWI Graz cooperation. The degree programme can be completed as a joint degree programme (§ 54d Universities Act 2002) together with the KTH Royal Institute of Technology, Stockholm, Sweden. The legal bases of this degree programme are the Universities Act 2002 (UG) and the Legal Regulations for Academic Affairs in the statutes of TU Graz and UNI Graz, as amended.

Please note: The English version of this document is a courtesy translation.

Only the German version is legally binding.

Table of Contents:

I. GENERAL	2
§ 1 SUBJECT MATTER OF DEGREE PROGRAMME AND QUALIFICATION PROFILE	2
§ 2 ADMISSION REQUIREMENTS	4
§ 3 STRUCTURE OF THE DEGREE PROGRAMME.....	5
§ 4 GROUP SIZES.....	6
§ 5 GUIDELINES FOR THE ALLOCATION OF PLACES IN COURSES	6
II. DEGREE PROGRAMME CONTENT AND STRUCTURE	7
§ 6 MODULES, COURSES AND SEMESTER ASSIGNMENT.....	7
§ 7 ELECTIVE MODULES	9
§ 8 FREE-CHOICE SUBJECTS	11
§ 9 MASTER'S THESIS.....	11
§ 10 REGISTRATION REQUIREMENTS FOR COURSES/EXAMINATIONS	11
§ 11 STAYS ABROAD AND INTERNSHIPS.....	12
§ 12 DOUBLE DEGREE PROGRAMME	12
III. EXAMINATION REGULATIONS AND CONCLUSION OF STUDIES	14
§ 13 ASSESSMENT OF MODULES	14
§ 14 MASTER'S EXAMINATION	14
§ 15 COMPLETION OF STUDIES	15
IV. ENTRY INTO FORCE AND TRANSITIONAL PROVISIONS	15
§ 16 ENTRY INTO FORCE.....	15
§ 17 TRANSITIONAL AGREEMENT	15
APPENDIX I: MODULE DESCRIPTIONS	16
APPENDIX II A: RECOMMENDED CURRICULUM TIMELINE FOR THE MASTER'S DEGREE PROGRAMME BIOTECHNOLOGY	27



APPENDIX II B: DOUBLE DEGREE PROGRAMME: RECOMMENDED CURRICULUM TIMELINE FOR STUDENTS WHOSE HOME UNIVERSITY IS TU GRAZ/UNI GRAZ	28
APPENDIX II C: DOUBLE DEGREE PROGRAMME: RECOMMENDED CURRICULUM TIMELINE FOR STUDENTS WHOSE HOME UNIVERSITY IS KTH ROYAL INSTITUTE OF TECHNOLOGY	29
APPENDIX III: RECOMMENDED FREE-CHOICE COURSES.....	30
APPENDIX IV: EQUIVALENCE LIST	31

I. General

§ 1 Subject matter of degree programme and qualification profile

The Master's Degree Programme Biotechnology is an engineering degree. Graduates of this study programme are awarded the academic degree 'Diplom-Ingenieurin' or 'Diplom-Ingenieur,' abbreviated as 'Dipl.-Ing.' or 'DI'. The international equivalent of this university degree is 'Master of Science,' abbreviated as 'MSc'. The Master's Degree Programme Biotechnology is held in English. As part of this degree programme, it is possible to participate in a Double Degree Programme with the KTH Royal Institute of Technology, Stockholm, Sweden.

(1) Subject matter of the degree programme

Biotechnology is one of the key technologies of this century and involves the use of biosystems to create applications for industry, agriculture, the environment and medicine. For this reason, biotechnology is a highly interdisciplinary subject area. Graduates of the Master's Degree Programme Biotechnology expand knowledge acquired in a subject-related bachelor's degree programme and receive a broad education in current and future-oriented fields of molecular biotechnology, environmental and food technology, enzyme technology and biocatalysis as well as bioprocess technology. Furthermore, this degree programme places particular emphasis on sustainability as it relates to the subject matter covered. This education provides students with both theoretical and practical state-of-the-art scientific knowledge – the latter in the form of in-depth practical exercises (laboratory courses, Project Laboratory) – and enables them to carry out independent scientific work. Students can specialise in various subject areas by choosing modules that match their interests. To promote internationalisation, a stay abroad is highly recommended.

(2) Qualification profile and competences

Graduates of the Master's Degree Programme Biotechnology have the following knowledge, skills and competences:

Knowledge and understanding

Graduates

- have significantly deepened/expanded their specialist knowledge in the following areas: Bioprocess Technology, Molecular Biotechnology and Bioinformatics, Environmental Biotechnology, as well as Food Biotechnology.



- have acquired fundamental knowledge that allows them to develop and/or apply ideas for the independent planning and execution of scientific experiments in accordance with the state of the art in science and technology.
- can define and interpret the specific features, limits, terminology and schools of thought of their field.
- have specialised in several of the following subject areas: Enzyme and Protein Technology, Systems and Synthetic Biotechnology, Bioprocess Engineering, Environmental Biotechnology as well as Food Biotechnology.

Application of knowledge

Graduates

- can apply complex scientific methods, in particular working and analytical techniques in microbiology, molecular biology, biochemistry, genetic, enzyme and fermentation technology.
- can work on scientific and engineering tasks independently.
- can apply their knowledge and problem-solving abilities in new and unfamiliar situations.
- can identify and apply the principles of good scientific practice.

Evaluation and assessment

Graduates

- take the societal, social and ethical effects into account in their specialist or scientific activities.
- are familiar with the methods of critical and analytical thinking used in the field of biotechnology and can provide support for or review assessments based on subject-specific data, which also take relevant social, scientific and ethical concerns into account.
- are able to independently solve complex scientific questions that arise in the field of biotechnology in an interdisciplinary and integrated way.
- can develop and implement new strategies during research approaches, taking into account and assessing current research results.
- have the skills to implement theoretical knowledge, evaluate results and recognise problems and alternatives.

Communicative and social skills

Graduates

- have mastered communication and presentation techniques and can use them appropriately.
- are able to write scientific texts.
- can communicate information, ideas, problems and their solutions clearly and unambiguously to an audience of both specialists and non-specialists.
- can work well in a team and have developed good social skills.



Organisational skills

Graduates

- can use learning strategies that enable them to further develop their knowledge independently.
- can work independently or in teams, motivating themselves and others.
- can take the initiative and assume leadership as well as provide guidance in specialist and organisational matters.

(3) Need and relevance of the degree programme for science and the labour market

Graduates of the Master's Degree Programme Biotechnology are able to pursue careers in management roles in basic research and applied research in the academic and industrial sectors. They are able to independently apply complex solutions in the fields of biotechnology. In particular, they are able to find corresponding jobs in industrial biotechnology, chemical manufacturing with biocatalytic processes, pharmaceutical research and production, food technology and processing, environmental biotechnology, in quality management and in the agricultural sector, as well as in relevant academic and non-academic research institutes and public authorities or institutions.

The Master's Degree Programme Biotechnology also provides students with the skills required for independent scientific work within the framework of a doctoral programme.

§ 2 Admission requirements

(1) The Master's Degree Programme Biotechnology builds on the Bachelor's Degree Programme Molecular Biology offered by NAWI Graz. Graduates of this bachelor's degree thus meet the admission requirements for the Master's Degree Programme Biotechnology. Furthermore, the following degree programmes are eligible for admission to the Master's Degree Programme Biotechnology without further requirements:

- a. Bachelor's Degree Programme Molecular Biosciences at an Austrian university
- b. Bachelor's Degree Programme Molecular Biotechnology at an Austrian university or university of applied sciences
- c. Bachelor's Degree Programme Chemistry at an Austrian university, provided that knowledge in the fields of biochemistry, molecular biology and biotechnology can be demonstrated to the extent of at least 23 ECTS credit points.

(2) Any degree programmes that are not mentioned in (1) are considered eligible for admission if at least 72 ECTS credit points have been positively completed in the following subject areas:

- a. 20 ECTS credit points from courses on chemistry
- b. 10 ECTS credit points from courses on microbiology and cell biology
- c. 25 ECTS credit points from courses on molecular biology and genetics
- d. 17 ECTS credit points from courses on biochemistry and biotechnology

(3) (a) Any degree programmes that are not mentioned in (1) and that do not meet the requirements of (2) are not considered equivalent to a subject-related degree programme. If at least 42 ECTS credit points have been completed in the subject areas mentioned in (2), full equivalence may be established by requiring supplementary examinations. Additional completion of supplementary examinations may be required to the extent of a maximum of 30 ECTS credit points.

- (b) Graduates of a bachelor's degree programme in chemistry completed at an Austrian university may be admitted by means of supplementary examinations if the required 23 ECTS credit points from the subject areas biochemistry, molecular biology and biotechnology cannot be proven. Additional completion of supplementary examinations from the subject areas mentioned in § 1 (c) may be required to the extent of a maximum of 30 ECTS credit points.
- (4) Any degree programmes that are not mentioned in (1) and do not meet the requirements of (2) and (3) are not close enough in subject matter to establish full equivalency, as they cannot establish equivalency even with supplementary examinations amounting to a maximum of 30 ECTS credit points. In such cases, admission to the Master's Degree Programme Biotechnology is not possible.
- (5) Proof of sufficient English language skills is a prerequisite for admission to the degree programme. The type of proof required is specified in a regulation issued by the Rectorate.

§ 3 Structure of the degree programme

- (1) The Master's Degree Programme Biotechnology with a workload of 120 ECTS credit points covers four semesters and is structured into compulsory modules, elective modules, free-choice subjects, a master's thesis and a master's examination as follows:

	ECTS
Compulsory Module A: Molecular Biotechnology and Bioinformatics	14
Compulsory Module B: Bioprocess Technology	14
Compulsory Module C: Environmental and Food Biotechnology	14
Compulsory Module D: Laboratory Project Biotechnology	14
Compulsory Module E: Supplement to Master's Thesis Biotechnology	3
Elective Modules	24
Master's thesis	30
Master's examination	1
Free Electives	6
Total	120

Examinations taken as part of a bachelor's or diploma degree programme that served as a prerequisite for admission to a subsequent master's degree programme can only be recognised for this subsequent master's degree programme to the extent that the scope of the bachelor's or diploma degree programme exceeds 180 ECTS credit points.

§ 4 Group sizes

The following maximum numbers of participants (group sizes) have been established:

Lecture (VO) Lecture part of lecture with integrated exercises (VU)	no restriction
Exercise (UE) Exercise part of lecture with integrated exercises (VU)	25
Laboratory course (LU)	6
Seminar (SE)	20
Project (PT)	6

Deviating from this, the following maximum number of participants (group sizes) apply to the following modules/courses:

Module	Course	Group sizes
B.4	Laboratory Course Bioprocess Technology (LU)	5
W6.4	Scientific Presentations (SE)	25
W6.5	Science Communication and Project Management (SE)	25
W6.6	Communicating Science - An Introduction (SE)	25
W6.8	Selected Topics of Biotechnology (SE)	25

§ 5 Guidelines for the allocation of places in courses

- (1) If the number of students exceeds the number of available places, students are allocated places on a course according to the following priority criteria, whereby the individual criteria are to be applied in the order given:
 - a. Position of the course in the curriculum (acc. to § 6 and § 7): Priority is given to students for whom the course is compulsory according to their curriculum over those who are taking the course as part of an elective module or free-choice subject.
 - b. Total of completed/recognised ECTS credit points for the degree programme: All study achievements completed in the degree programme for which the student wants to take the course are taken into account for the ranking. Students with the highest total of ECTS credit points already completed in their current degree programme are ranked preferentially.
 - c. Number of semesters spent studying in the degree programme so far: Students are ranked according to the number of semesters they have already studied in the degree programme. Priority is given to those who have studied for longer.
 - d. Decision by lot: If it is not possible to rank students according to the above criteria, admission to the course is decided by lot.
- (2) Up to 10 % of the places on the course are reserved for students completing part of their studies at a NAWI Graz university as part of a mobility programme.



II. Degree Programme Content and Structure

§ 6 Modules, courses and semester assignment

- (1) The individual courses of this master's degree programme and their designation as compulsory and elective modules are set out below. The knowledge, methods or skills to be taught in each course are described in detail in Appendix I. The assignment of courses to specific semesters is a recommendation for students and ensures that the sequence of courses is best able to build on prior knowledge and that the workload of an academic year does not exceed 60 ECTS credit points. The allocation of the courses to the participating universities is defined in Appendix II a and § 7.

Master's Degree Programme Biotechnology						ECTS credit points per semester			
Module	Course	SSt	Type	ECTS	I	II	III	IV	
Compulsory Module A: Molecular Biotechnology and Bioinformatics									
A.1	Molecular Biotechnology I	2	VO	3	3				
A.2	Molecular Biotechnology II	2	VO	3		3			
A.3	Bioinformatics	2	VO	3		3			
A.4	Laboratory Course Molecular Biotechnology	5	LU	5		5			
Subtotal Compulsory Module A		11		14	3	11			
Compulsory Module B: Bioprocess Technology									
B.1	Bioprocess Technology I	2	VO	3	3				
B.2	Bioprocess Technology II	2	VO	3		3			
B.3	Enzyme Technology and Biocatalysis	2	VO	3	3				
B.4	Laboratory Course Bioprocess Technology	5	LU	5		5			
Subtotal Compulsory Module B		11		14	6	8			
Compulsory Module C: Environmental and Food Biotechnology									
C.1	Biodiversity and Applied Microbiology	2	VO	3	3				
C.2	Environmental Biotechnology	2	VO	3	3				
C.3	Laboratory Course Environmental Biotechnology	3	LU	3	3				
C.4	Food Biotechnology ¹	4	VU	5	5				
Subtotal Compulsory Module C		11		14	14				
Compulsory Module D: Laboratory Project Biotechnology									
D.1	Laboratory Course Bioinformatics	2	UE	2			2		
D.2	Laboratory Project Biotechnology	9	PT	12			12		
Subtotal Compulsory Module D		11		14			14		
Compulsory Module E: Supplement to Master's Thesis Biotechnology									
E.1	Research in Biotechnology ²	1	SE	1			1		
E.2	Advanced Seminar for Master's Thesis Biotechnology ²	2	SE	2				2	
Subtotal Compulsory Module E		3		3			1	2	
Total Compulsory Modules		47		59	23	19	15	2	
Elective Module W1: Enzyme and Protein Technology				0-12					
Elective Module W2: Systems and Synthetic Biotechnology				0-12					
Elective Module W3: Bioprocess Engineering				0-12					
Elective Module W4: Environmental Biotechnology				0-12					
Elective Module W5: Food Biotechnology				0-12					
Elective Module W6: General Elective Module				4-8					
Total Elective Module[s] acc. to § 7				24	7	9	8		
Master's thesis				30			3	27	
Master's examination				1				1	
Free-choice subjects acc. to § 8				6		2	4		
Overall total				120	30	30	30	30	

¹: 2 semester course hours lecture part, 2 semester course hours exercise part. ²: These courses are assessed as “successful completed” or as “not completed”.

§ 7 Elective modules

- (1) In the Master’s Degree Programme Biotechnology, courses from the Elective Modules totalling 24 ECTS credit points must be completed. Courses totalling at least 8 ECTS credit points must be chosen from the two of the Elective Modules (W1–W5) listed below. Any missing ECTS credit points must be completed through courses in the Elective Module W6.

Elective Module W1: Enzyme and Protein Technology					
Course	SSt	Type	ECTS	UNI Graz ³	TU Graz ³
W1.1 Molecular Enzymology	2	VO	3	SS	SS
W1.2 Protein Engineering	1.3	VO	2		WS
W1.3 Structural Bioinformatics and Molecular Modelling	2	VO	3	SS	
W1.4 Biocatalysis	2	VO	3	SS	
W1.5 Integrative Structural Biochemistry	2	VO	3		SS
W1.6 Protein Technology	2	VO	3		SS
W1.7 Protein Design	2	VO	3		SS
W1.8 Applied Enzymology	1.3	SE	2		SS

Elective Module W2: Systems and Synthetic Biotechnology					
Course	SSt	Type	ECTS	UNI Graz ³	TU Graz ³
W2.1 Molecular Biology and Cell Engineering	1.3	VO	2		SS
W2.2 Metabolic Engineering	1.3	VO	2		SS
W2.3 Synthetic Biotechnology	2	SE	3		WS
W2.4 Computational Biotechnology ⁴	2	VU	3		SS
W2.5 Systems Biology	2	SE	3		SS
W2.6 Computational Systems Biotechnology ⁴	2	VU	3	SS	

⁴: 1 semester course hour lecture part, 1 semester course hour exercise part.

Elective Module W3: Bioprocess Engineering					
Course	SSt	Type	ECTS	UNI Graz ³	TU Graz ³
W3.1 Metabolic Engineering	1.3	VO	2		SS
W3.2 Bioprocess Optimisation and Process Control	2	VO	3		SS
W3.3 Bioprocess Technology of Fungi and Cell Cultures	2	VO	3		WS
W3.4 Sustainable Process Technology	2	VO	3		SS
W3.5 Bioprocess Design ⁵	2	VU	3		SS
W3.6 Fermentation Technology ⁶	1.3	VU	2		WS
W3.7 Modelling and Simulation in Biotechnology	2	VO	3		WS

⁵: 1.3 semester course hours lecture part, 0.7 semester course hours exercise part.

⁶: 0.9 semester course hours lecture part, 0.4 semester course hours exercise part.

Elective Module W4: Environmental Biotechnology					
Course	SSt	Type	ECTS	UNI Graz ³	TU Graz ³
W4.1 Recent Advances in Environmental Microbiology	1.3	SE	2		WS
W4.2 Bioremediation ⁷	2	VU	2		WS
W4.3 Enzymatic Processes in Environmental and Human Technology	1.3	VO	2		WS
W4.4 Plant Biotechnology	0.7	VO	1		SS
W4.5 Microbiome in Health and Environment	1.5	VO	2		SS
W4.6 Microbiome Analysis - Lab Course	3	LU	3		WS
W4.7 Climate Change and Microbiomes ⁷	2	VU	2		SS

⁷: 1 semester course hour lecture part, 1 semester course hour exercise part.

Elective Module W5: Food Biotechnology					
Course	SSt	Type	ECTS	UNI Graz ³	TU Graz ³
W5.1 Enzymatic and Microbial Food Processing	2	VO	3		WS
W5.2 Food Chemistry and Technology II	2	VO	3		WS
W5.3 Sensory Evaluation of Food ⁸	2	VU	2		SS
W5.4 Postharvest Technology	1	VO	1.5		SS
W5.5 Industrial Biotechnology	1	VO	1.5		WS
W5.6 Quality Assurance GMP in Pharmaceutical, Food and Biotechnological Processing	2	VO	3		WS

⁸: 1 semester course hour lecture part, 1 semester course hour exercise part.

Elective Module W6: General Elective Module					
Course	SSt	Type	ECTS	UNI Graz ³	TU Graz ³
W6.1 Biostatistics	1	VO	1.5	WS	
W6.2 Applied Mass Spectrometry	1.3	VO	1.5		WS
W6.3 Electron Microscopy in Biotechnology	2	VO	3		WS
W6.4 Scientific Presentations	2	SE	2	SS	
W6.5 Science Communication and Project Management	2	SE	2	SS	
W6.6 Communicating Science - An Introduction	2	SE	2	WS	
W6.7 Basics of Project Management for Natural Scientists	1.5	VO	2	SS	
W6.8 Selected Topics of Biotechnology ⁹	1–3	VO	1.5–4.5	X	X
	1–3	SE	1–3	X	X
	1–2	UE	1–2	X	X
W6.9 Professional Research Practice ¹⁰			1.5–6	X	X
W6.10 Good Scientific Practice	1	VO	1.5	WS	

³: Assignment of the course to the participating universities. The course is offered in the winter semester (WS), the summer semester (SS) or in both semesters (X).

⁹: The structure of W6.8 is described in § 7 (2).

¹⁰: Internship within the meaning of § 11 (3).

- (2) Courses given the title “Selected Topics of Biotechnology” are assigned to W6 General Elective Module. These courses have descriptive subheadings. Courses with different subheadings must be classified as different courses.

- (3) In addition to the courses mentioned above, all courses from the Elective Modules W1–W5 from the Master’s Degree Programme Biotechnology that the student has not yet completed, as well as all compulsory courses and courses from the elective modules of the NAWI Graz Master’s Degree Programmes Molecular Microbiology, Biochemistry and Molecular Biomedical Sciences, Chemistry and Technical Chemistry as well as all other NAWI Graz offers for “soft skills” may be completed within the framework of the Elective Module W6. Interdisciplinary courses from the TIMEGATE course catalogue of UNI Graz or the Science, Technology and Society Unit (STS Unit) of TU Graz may also be completed.

§ 8 Free-choice subjects

- (1) The courses to be completed as part of the free-choice subjects in the Master’s Degree Programme Biotechnology are designed to provide individual strategic focus and further development of the students. They may be freely selected from the courses offered by any recognised national or international universities as well as recognised national post-secondary educational institutions. Appendix III contains recommendations for specific free-choice courses.
- (2) If no specific number of ECTS credit points is assigned to a free-choice subject, ECTS credit points are allocated by the officer responsible for study matters according to the estimated time spent on the course.

§ 9 Master’s thesis

- (1) The purpose of the master’s thesis is to demonstrate a student’s ability to work on scientific topics on their own, both with regard to content and methodology.
- (2) The topic of the master’s thesis must be taken from or meaningfully related to the Compulsory Modules A–C or the Elective Modules W1–W5.
- (3) The master’s thesis must be registered with the respective officer responsible for study matters via the Dean’s Office before beginning work on it.

§ 10 Registration requirements for courses/examinations

- (1) The registration condition for the final master’s examination before a committee is proof of positive assessment of all study achievements/examinations as described in § 6 bis 8 and a positive grade for the master’s thesis.
- (2) In addition, the listed registration requirements apply for the following courses:

Course/examination/module	Prerequisite
D.2 Laboratory Project Biotechnology (PT)	Two of the following courses must have been successfully completed: A.4 Laboratory Course Molecular Biotechnology (LU) B.4 Laboratory Course Bioprocess Technology (LU) C.4 Food Biotechnology (VU)
E.2 Advanced Seminar for Master’s Thesis Biotechnology (SE)	D.2 Laboratory Project Biotechnology (PT)



§ 11 Stays abroad and internships

(1) Recommended stays abroad

It is recommended for students who are not enrolled in the Double Degree Programme to spend time abroad in the course of their studies. In this master's degree programme, the 2nd or 3rd semesters are particularly suitable for this purpose.

It is also possible to obtain recognition of work done in shorter study periods abroad, for example participation in summer or winter schools, as part of the free-choice subjects, by application to the officer responsible for study matters.

(2) Practical training

It is possible to include practical trainings amounting to a maximum of 6 ECTS credit points as part of the free-choice subject. Each week of full employment corresponds to 1.5 ECTS credit points. Active participation in an academic event may also count as practical training. This practical training must be approved by the officers responsible for study matters and considered a useful addition to the degree programme. Internships for relevant work experience (3) cannot be counted as practical training within the framework of free-choice subjects.

(3) Internship for relevant work experience

As part of Elective Module W6 General Elective Module, it is possible to complete an internship for relevant work experience (listed as W6.9 Professional Research Practice) worth a maximum of 6 ECTS credit points. Each week of full employment corresponds to 1.5 ECTS credit points. Completion of an internship for relevant work experience must be approved by the officers responsible for study matters. Practical trainings (2) cannot be counted as internships for relevant work experience within the framework of Elective Module W6.

Internships for relevant work experience must meet the following criteria:

- The internship must be completed in a research laboratory.
- The student must write a report (1–2 pages A4) about the internship. This report must outline the objectives of the research study and the methods used at the research laboratory.
- The report must be approved by a head of the research group.

§ 12 Double Degree Programme

As part of this degree programme, it is possible to participate in a Double Degree Programme with the KTH Royal Institute of Technology, Stockholm, Sweden (KTH). The total scope of the programme is 120 ECTS credit points.

This programme is a joint degree programme in accordance with § 51 (2) 26 of the Universities Act 2002 (UG) and is established as an elective specialisation within the framework of this degree programme.

Admission to the double degree programme is subject to the regulations of the cooperation agreement between KTH, TU Graz and UNI Graz. The Dean of Studies at TU Graz and the chairperson of the curricular committee at UNI Graz decide on admission by mutual agreement. Requirements, selection criteria and deadlines are published annually on the programme website after consultation with KTH.

(1) Students whose home university is TU Graz/UNI Graz

Students whose home university is TU Graz/UNI Graz must complete at least the following courses and achievements with a total scope of 60 ECTS credit points. For a recommended curriculum timeline, see Appendix II b.

1. Compulsory Modules A, B and C worth a total of 42 ECTS credit points must be completed in accordance with § 6.
2. Courses from Elective Modules W1–W6 (see § 7) must be completed totalling 12 ECTS credit points, with at least 8 ECTS credit points of which must be from a non-general Elective Module (W1–W5).
3. 6 ECTS credit points worth of electives must be completed, which can be freely chosen from the range of courses offered at TU Graz/UNI Graz.

At the host university KTH, students must complete at least the following courses and achievements with a total scope of 60 ECTS credit points.

4. Compulsory modules (referred to as ‘Mandatory Courses’ at KTH) must be completed worth a total of 22.5 ECTS credit points:
 - a) Theory and Methodology of Science (VO), worth 3.5 ECTS credit points
 - b) Industrial Management for Biotechnology (VO), worth 4 ECTS credit points
 - c) Bioprocess Design (PT), worth 15 ECTS credit points
5. An elective module (referred to as ‘Recommended Courses’ at KTH) must be completed worth a total of 7.5 ECTS credit points. The courses of the elective module are published annually in the KTH course catalogue.
6. A degree project (see (3)) must be completed totalling 30 ECTS credit points. The topic of the master’s thesis is to be chosen in accordance with § 9 (2) or taken from one of the compulsory or elective modules at KTH.

(2) Students whose home university is KTH Royal Institute of Technology

Students whose home university is KTH must complete at least the following courses and achievements at TU Graz/UNI Graz with a total scope of 60 ECTS credit points. For a recommended curriculum timeline, see Appendix II c.

1. Compulsory modules and courses from compulsory modules must be completed to a total of 22 ECTS credit points:
 - a) Compulsory Module D, worth 14 ECTS credit points in acc. with § 6
 - b) Compulsory Module E, worth 3 ECTS credit points in acc. with § 6
 - c) From Compulsory Module C: C.4, Food Biotechnology, worth 5 ECTS credit points in acc. with § 6
2. Courses from the Elective Modules W1–W5 (in acc. with § 7) must be completed totalling 4 ECTS credit points.
3. 4 ECTS credit points worth of electives must be completed, which can be freely chosen from the range of courses offered at TU Graz/UNI Graz.
4. The master’s thesis and master’s examination (see (3)) must be completed totalling 30 ECTS credit points.

(3) Regulations regarding the master's thesis

For students of the Double Degree Programme, the degree project / master's thesis includes a thesis written in English and an oral presentation and defence of this paper before a committee. The written thesis must be submitted at the respective host university.

The research project and the written thesis are supervised by a main supervisor at the host university. Co-supervision of these two study achievements by the home university is optional.

The presentation and defence of the thesis take place before a committee composed of 3 committee members. The main supervisor is always a member of the examination committee. The examination committee assesses the degree project / master's thesis.

It is possible for students to complete further courses after submitting the degree project / master's thesis.

(4) Academic degree within the framework of the Double Degree Programme

Graduates of the Master's Degree Programme Biotechnology who have completed the Double Degree Programme are awarded the academic degree 'Diplom-Ingenieurin' or 'Diplom-Ingenieur', abbreviated as 'Dipl.-Ing.' or 'DI', by TU Graz/UNI Graz and the academic degree 'Master of Science', abbreviated as 'MSc' by KTH as a double degree in accordance with § 87 (5) of the Universities Act 2002 (UG).

III. Examination Regulations and Conclusion of Studies

§ 13 Assessment of modules

The overall grade for a module is the average grade of all examinations completed as part of the module, weighted according to ECTS credit points. The grade is rounded up if the decimal place exceeds 0.5. Otherwise, the grade is rounded down. Examinations whose assessment consists only of "successfully completed/not completed" are not included in the calculation of the overall module assessment. Positive assessment of a module requires the positive assessment of all individual examinations to be completed within the module.

§ 14 Master's examination

- (1) The master's examination is an oral examination before a committee and consists of
 - the presentation of the master's thesis (max. 20 minutes),
 - the examination interview on the subject matter of the master's thesis and other subject-related areas acc. to § 9 (2), as well as
 - an examination interview on another subject area related to the Compulsory Modules A–C or Elective Modules W1–W5 of the master's degree programme.
- (2) The subject areas acc. to (1) are determined by the officer responsible for study matters of the university of admission based on the candidate's suggestion. The total duration of the master's examination before a committee is usually 60 minutes and must not exceed 75 minutes.
- (3) The examination committee for the master's examination includes the supervisor of the master's thesis and two other members who are nominated by the officer responsible for study matters,



after hearing any recommendations from the candidate. The examination committee must be chaired by one of the members who is not the supervisor of the master's thesis.

- (4) The master's examination must be graded based on the performance achieved during the examination.

§ 15 Completion of studies

- (1) The master's degree programme is completed once all academic achievements pursuant to § 3 and § 12 have been assessed positively.
- (2) Successful completion of the degree programme is documented by issuing a certificate. The master's degree certificate is composed of:
 - a. a list of all the completed modules as set out in § 3 (along with their ECTS credit points) and their assessment results,
 - b. the title and assessment of the master's thesis,
 - c. the assessment of the master's examination,
 - d. the total of the ECTS credit points of the free-choice subjects as defined in § 8, and
 - e. the overall assessment.

IV. Entry Into Force and Transitional Provisions

§ 16 Entry into force

This 2024 curriculum shall enter into force on 1 October 2024.

§ 17 Transitional agreement

Students of the Master's Degree Programme Biotechnology who are subject to the **2019 curriculum** in its 2017 version when this curriculum enters into force on **1 October 2024**, are entitled to complete their studies according to the provisions of the curriculum in its **2019** version by **30 September 2027**. If the degree programme is not completed by **30 September 2027**, students are subject to the curriculum for the Master's Degree Programme Biotechnology as amended. Students are entitled to voluntarily opt for the new curriculum at any time within the admission periods. A written declaration to this effect, which shall be irrevocable, should be addressed to the officer responsible for study matters. The equivalence between those examinations completed within the framework of the curriculum version **2019** and those completed within the framework of the curriculum version **2024** is established in Appendix IV: Equivalence List.



Appendices to the Curriculum for the Master's Degree Programme Biotechnology

Appendix I: Module Descriptions

Compulsory Module A:	Molecular Biotechnology and Bioinformatics
ECTS credit points	14
Contents	Problems and strategies used in the heterologous expression of genes are addressed using various, technologically relevant organisms, including cell cultures of higher organisms and transgenic plants and animals. In addition, the students are provided with fundamental information in the area of protein engineering, metabolic engineering, cell engineering, synthetic biology and system biology, as well as basic information about computer-supported methods used to analyse sequence, structure and metabolic data. Machine learning as it relates to molecular biotechnology is also discussed.
Learning outcomes	After completing the module, students are able to directly apply their theoretical knowledge in molecular biotechnology and computational biotechnology. Students master working and analytical techniques used in cell, protein, and metabolic engineering. Students master the essential methods used for the computer-supported analysis of DNA and protein sequences and can independently plan simple cell and protein engineering experiments, carrying them out in a team. After completing the module, students are able to understand and discuss basic approaches taken in the molecular development of biosystems and apply these when independently planning experimental work.
Recommended prerequisites for participation	Fundamental knowledge of biotechnology, molecular biology, gene technology and bioinformatics recommended.
Frequency in which the module is provided	Every academic year

Compulsory Module B:	Bioprocess Technology
ECTS credit points	14
Contents	The theoretical and methodological knowledge that is necessary for developing and optimising modern bioprocesses on a technical scale is deepened. The theoretical and practical design of bioprocesses is presented by integrating elements of molecular biology and process engineering. The entire process chain, including the product purification, is discussed with reference to the essential unit operations and industrial examples. Opportunities and challenges in the field of biotechnology as a key factor in the circular economy are explained with a focus on the production of a wide variety of products from cheap raw materials such as lignocellulose, CO ₂ and other C1 molecules.
Learning outcomes	After completing the module, students are able to understand and describe the basic approaches that are taken to develop bioprocesses, as well as how to plan and implement these independently in experiments. Students master working and analytical techniques used in fermentation technology, process technology and enzyme technology. Students master the essential methods used to cultivate microorganisms and the corresponding processing techniques. The students can plan simple bioprocesses with microorganisms or enzymes independently or as a member of a team.
Recommended prerequisites for participation	Basic knowledge of biotechnology, molecular biology, genetic engineering and bioinformatics recommended.
Frequency in which the module is provided	Every academic year

Compulsory Module C:	Environmental and Food Biotechnology
ECTS credit points	14
Contents	Students deepen their theoretical and methodological knowledge of bioprocesses related to the environment and food, as well as address questions about biodiversity and how to access bioresources. Students gain insight into the structural and functional diversity of microbiomes as well as microbial and enzyme-catalysed processes in the environment. Furthermore, methods in the production of food and feed are presented. State-of-the-art molecular and enzymatic analysis methods used in these fields and basic mechanistic principles are discussed in detail. Particular emphasis is placed on the topic of sustainability in food production in the context of food biotechnology.
Learning outcomes	Students acquire a sound knowledge of environmental and food biotechnology. Students master working and analytical techniques used in microbiology, microbiome research, and environmental and food biotechnology. After completing the module, students are able to understand and describe the basic approaches that are taken to develop bioprocesses used in the fields of environmental and food technology, as well as how to plan and implement these independently in experiments. Students are able to evaluate food processing with regard to process sustainability.
Recommended prerequisites for participation	Fundamental knowledge of microbiology, molecular biology and biotechnology recommended.
Frequency in which the module is provided	Every academic year

Compulsory Module D:	Laboratory Project Biotechnology
ECTS credit points	14
Contents	The module Laboratory Project Biotechnology provides an introduction to independent scientific work with an emphasis placed on experiments and the scientific analysis of the data obtained. Team members plan and carry out experiments, conducting teamwork in current research projects for smaller subprojects in this module.
Learning outcomes	After completing the courses in this module, students are able to independently plan and carry out the experiments in small research and technology projects, as well as perform the corresponding analyses of data.
Recommended prerequisites for participation	Advanced knowledge of biotechnology, molecular biology and bioinformatics recommended. Completion of courses in accordance with to § 10 (2).
Frequency in which the module is provided	D.1 Laboratory Course Bioinformatics: every academic year D.2 Laboratory Project Biotechnology: every semester, start by individual agreement

Compulsory Module E:	Supplement to Master's Thesis Biotechnology
ECTS credit points	3
Contents	As part of this seminar, experiments are planned and the results obtained are presented, interpreted and discussed as part of the students' education. In addition, the relevant current literature for the research project carried out as part of the master's thesis is compiled, presented and discussed. Research in Biotechnology offers students insight into the current research of research groups involved in teaching.
Learning outcomes	This module supplements the master's thesis and serves to develop and promote the students' communication and interaction with their supervising teachers and cooperation partners. After completing the course, students are able to use the relevant, specialised literature, lead discussions related to science and technology and formulate related questions about current problems.
Recommended prerequisites for participation	Advanced knowledge of biotechnology, molecular biology and bioinformatics recommended. Completion of courses in accordance with to § 10 (2).
Frequency in which the module is provided	E.1, Research in Biotechnology: every academic year E.2, Advanced Seminar for Master's Thesis Biotechnology: Each semester, starting date defined upon individual agreement.

Elective Module Descriptions

Elective Module W1	Enzyme and Protein Technology
ECTS credit points	0–12
Contents	The theoretical and methodological knowledge that is necessary for developing and optimising modern enzymatic processes and for the production of therapeutically relevant proteins on an industrial scale is further deepened. The theoretical and practical design of enzymatic bioprocesses, as well as the design and use of proteins, are presented by integrating elements of molecular and process engineering. Biological differences between the sexes with regard to drug efficacy and their integration into drug development are addressed.
Learning outcomes	The students are provided with sound theoretical knowledge in enzymology and the development of proteins. Students master working and analytical techniques that are used in enzymology, the modification of proteins and enzyme technology. After completing the module, students are able to understand and describe the basic approaches taken to develop proteins and the related enzymatic processes and to apply these approaches when independently planning experiments. Students learn modern technologies for the production and analysis of (therapeutically relevant) recombinant proteins and how to apply them.
Recommended prerequisites for participation	Basic knowledge of biotechnology, molecular biology, genetic engineering and bioinformatics recommended.
Frequency in which the module is provided	Every academic year



Elective Module W2	Systems and Synthetic Biotechnology
ECTS credit points	0–12
Contents	The theoretical and methodological knowledge that is necessary for developing and optimising modern bioprocesses on a technical scale is deepened. The theoretical and practical design of bioprocesses is presented by integrating elements of molecular biology and process engineering.
Learning outcomes	Students acquire a sound knowledge in approaches taken in system biology and synthetic biology to establish biocatalytic processes. Students master working and analytical techniques used in system biology and the design of production strains and processes. Students master the essential methods used to modify and cultivate microorganisms. The students can plan simple bioprocesses with microorganisms or enzymes independently or as a member of a team. After completing the module, students are able to understand and describe the basic approaches that are taken to develop strains for bioprocesses, as well as how to plan and implement these independently in experiments.
Recommended prerequisites for participation	Fundamental knowledge of chemistry, biotechnology and molecular biology recommended.
Frequency in which the module is provided	Every academic year

Elective Module W3	Bioprocess Engineering
ECTS credit points	0–12
Contents	The theoretical and methodological knowledge that is necessary for developing and optimising modern bioprocesses on a technical scale is deepened. The theoretical and practical design of bioprocesses is presented by integrating elements of molecular biology and process engineering. The entire process chain, including the product purification, is discussed with reference to the essential unit operations and industrial examples. Opportunities and challenges in the field of biotechnology as a key factor in the circular economy are explained with a focus on the production of a wide variety of products from cheap raw materials such as lignocellulose, CO ₂ and other C1 molecules.
Learning outcomes	Students acquire a sound knowledge of bioprocess technology. Students master working and analytical techniques used in fermentation technology, process technology and enzyme technology. Students master the essential methods used to cultivate microorganisms and the corresponding processing techniques. The students can plan simple bioprocesses with microorganisms or enzymes independently or as a member of a team. After completing the module, students are able to understand and describe the basic approaches that are taken to develop bioprocesses, as well as how to plan and implement these independently in experiments.
Recommended prerequisites for participation	Basic knowledge of biotechnology, molecular biology, genetic engineering and bioinformatics recommended.
Frequency in which the module is provided	Every academic year

Elective Module W4	Environmental Biotechnology
ECTS credit points	0–12
Contents	Students deepen their theoretical and methodological knowledge of bioprocesses related to the environment and food, as well as address questions about biodiversity and how to access bioresources. The negative effects of global change on crop production are discussed and biotechnological solutions are presented. Furthermore, enzymatic and microbial degradation pathways of xenobiotics in nature and methods of environmental analysis are discussed. Through the presentation and independent implementation of the latest molecular and bioinformatics analysis methods, knowledge of the structural and functional diversity of microbiomes is deepened.
Learning outcomes	Students gain in-depth knowledge of microbial and biochemical processes in the environment. Theoretical know-how is combined with laboratory activities, along with training in advanced molecular, bioinformatics and statistical data analysis methods. After completing the module, students are able to understand and describe the basic approaches in biotechnology and microbiome research related to environmental and health-relevant bioprocesses and implement these in independent planning, experimental work and data analysis.
Recommended prerequisites for participation	Fundamental knowledge of microbiology, molecular biology and biotechnology recommended.
Frequency in which the module is provided	Every academic year

Elective Module W5	Food Biotechnology
ECTS credit points	0–12
Contents	Students deepen their theoretical and methodological knowledge of bioprocesses related to food and learn how to address questions about further processing. Modern biotechnological processes used to produce food and animal feed are presented. Modern microbial and enzymatic methods used in these fields and basic mechanistic knowledge are covered in detail, and the essential aspects of quality assurance are described. Particular emphasis is placed on the topic of sustainability in food production in the context of food biotechnology.
Learning outcomes	Students acquire a sound knowledge of food biotechnology. Students master working and analytical techniques used in food biotechnology and have a general overview of food production. Additionally, they receive training in sensory analysis. After completing the module, students are able to understand and describe the basic approaches that are taken to develop bioprocesses used in food technology, as well as how to plan and implement these independently in experiments. Students are able to evaluate processes with regard to their sustainability.
Recommended prerequisites for participation	Fundamental knowledge of chemistry, microbiology, molecular biology and biotechnology and food technology recommended.
Frequency in which the module is provided	Every academic year

Elective Module W6	General Elective Module
ECTS credit points	4–8
Contents	In this module, an overview is presented of all courses that allow students to deepen or apply their specialist knowledge in specific areas. In addition, courses in the module discuss science communication and project management as well as the fundamental principles of good scientific practice in more detail.
Learning outcomes	Students have the ability to critically analyse scientific data, to interpret it responsibly and with integrity and to present it in a comprehensible manner. They are able to communicate scientific data and the resulting scientific knowledge in an understandable way both to experts and to laypeople. Furthermore, they can present research content and results to a broader audience. They are able to communicate in an interdisciplinary manner and work both independently and in teams. Students also master the fundamentals of project management with a focus on application in the field of scientific research. They are thus prepared for the complexity of managing scientific projects. In the process, they develop strong teamwork skills and social skills.
Recommended prerequisites for participation	none
Frequency in which the module is provided	Every academic year

Appendix II a: Recommended Curriculum Timeline for the Master's Degree Programme Biotechnology

Recommended curriculum timeline

1st semester	SSt	Type	ECTS	Uni Graz ¹	TU Graz ¹
A.1, Molecular Biotechnology I	2	VO	3		x
B.1, Bioprocess Technology I	2	VO	3		x
B.3, Enzyme Technology and Biocatalysis	2	VO	3	x	x
C.1, Biodiversity and Applied Microbiology	2	VO	3		x
C.2, Environmental Biotechnology	2	VO	3		x
C.3, Laboratory Course Environmental Biotechnology	3	LU	3		x
C.4, Food Biotechnology	4	VU	5		x
W1–W6, Elective Module(s) acc. to § 7			7	x	x
1st semester total			30		
2nd semester					
A.2, Molecular Biotechnology II	2	VO	3		x
A.3, Bioinformatics	2	VO	3		x
A.4, Laboratory Course Molecular Biotechnology	5	LU	5		x
B.2, Bioprocess Technology II	2	VO	3		x
B.4, Laboratory Course Bioprocess Technology	5	LU	5		x
W1–W6, Elective Module(s) acc. to § 7			9	x	x
Free Electives acc. to § 8			2	x	x
2nd semester total			30		
3rd semester					
D.1, Laboratory Course Bioinformatics	2	UE	2		x
D.2, Laboratory Project Biotechnology	9	PT	12	x	x
E.1, Research in Biotechnology	1	SE	1		x
Master's thesis ²			3	x	x
W1–W6, Elective Module(s) acc. to § 7			8	x	x
Free Electives acc. to § 8			4	x	x
3rd semester total			30		
4th semester					
E.2, Advanced Seminar for Master's Thesis Biotechnology	2	SE	2	x	x
Master's thesis ²			27	x	x
Master's examination			1	x	x
4th semester total			30		
Total overall ECTS			120		

¹ Assignment of the course to the participating universities. Both universities are named if the course is offered at both universities in combination, in parallel or alternately.

² In total, the master's thesis corresponds to 30 ECTS credit points.

Appendix II b: Double Degree Programme: Recommended Curriculum Timeline for Students whose Home University is TU Graz/UNI Graz

Recommended curriculum timeline

1st semester	SSt	Type	ECTS	Uni Graz ¹	TU Graz ¹	KTH ¹
A.1, Molecular Biotechnology I	2	VO	3		x	
B.1, Bioprocess Technology I	2	VO	3		x	
B.3, Enzyme Technology and Biocatalysis	2	VO	3	x	x	
C.1, Biodiversity and Applied Microbiology	2	VO	3		x	
C.2, Environmental Biotechnology	2	VO	3		x	
C.3, Laboratory Course Environmental Biotechnology	3	LU	3		x	
C.4, Food Biotechnology	4	VU	5		x	
W1–W6, Elective Module(s) acc. to § 7			7	x	x	
1st semester total			30			
2nd semester						
A.2, Molecular Biotechnology II	2	VO	3		x	
A.3, Bioinformatics	2	VO	3		x	
A.4, Laboratory Course Molecular Biotechnology	5	LU	5		x	
B.2, Bioprocess Technology II	2	VO	3		x	
B.4, Laboratory Course Bioprocess Technology	5	LU	5		x	
W1–W6, Elective Module(s) acc. to § 7			9	x	x	
Electives acc. to § 12 (1) 3			2	x	x	
2nd semester total			30			
3rd semester						
Theory and Methodology of Science		VO	3.5			x
Industrial Management for Biotechnology		VO	4			x
Bioprocess Design		PT	15			x
Recommended Courses at KTH acc. § 12 (1) 5			7.5			x
3rd semester total			30			
4th semester						
Degree project acc. to § 12 (1) 6 and (3)			30			x
4th semester total			30			
Total overall ECTS			120			

¹ Assignment of the course to the participating universities. The course is assigned to both universities (TU Graz/UNI Graz) if the course is offered jointly, in parallel, or alternately.

Appendix II c: Double Degree Programme: Recommended Curriculum Timeline for Students whose Home University is KTH Royal Institute of Technology

Recommended curriculum timeline

1st semester	SSt	Type	ECTS	Uni Graz ¹	TU Graz ¹
at KTH Stockholm, see curriculum					
1st semester total			30		
2nd semester					
at KTH Stockholm, see curriculum					
2nd semester total			30		
3rd semester					
C.4, Food Biotechnology	4	VU	5		x
D.1, Laboratory Course Bioinformatics	2	UE	2		x
D.2, Laboratory Project Biotechnology	9	PT	12	x	x
E.1, Research in Biotechnology	1	SE	1		x
Master's thesis acc. to § 12 (2) 4 and (3) ²			6	x	x
W1–W5, Elective Module(s) acc. to § 7			2	x	x
Electives acc. to § 12 (2) 3			2	x	x
3rd semester total			30		
4th semester					
E.2, Advanced Seminar for Master Thesis Biotechnology	2	SE	2	x	x
Master's thesis acc. to § 12 (2) 4 and (3) ²			24	x	x
W1–W6, Elective Module(s) acc. to § 7			2	x	x
Electives acc. to § 12 (2) 3			2	x	x
4th semester total			30		
Total overall ECTS			120		

¹ Assignment of the course to the participating universities. Both universities are named if the course is offered at both universities in combination, in parallel or alternately.

² In total, the master's thesis acc. to § 12 (3) corresponds to 30 ECTS credit points.



Appendix III: Recommended Free-Choice Courses

As free-choice subjects, students can choose courses as desired in accordance with § 8 of this curriculum.

For students to broaden their knowledge, courses in the fields of foreign languages, social competence, technological impacts assessment and women's and gender studies are recommended. In particular, the following institutions and service departments are offered:

- Languages, Key Competencies and In-House Training of TU Graz,
- Science, Technology and Society Unit (STS Unit) of TU Graz,
- Treffpunkt sprachen – Centre for Language, Plurilingualism and Didactics,
- The transfer initiative for management and entrepreneurship fundamentals, awareness, training and employability ("TIMEGATE"), and
- Centre for Social Competence of Uni Graz.

Furthermore, courses listed in the catalogue of electives/elective modules for the Master's Degree Programmes Biotechnology, Molecular Microbiology, Biochemistry and Molecular Biomedical Sciences, Chemistry, Technical Chemistry, Chemical and Pharmaceutical Engineering, and Chemical and Process Engineering are recommended.



Appendix IV: Equivalence List

(1) Equivalency of courses when switching from the expiring curriculum version 2019 to the new curriculum version 2024

The courses of the expiring curriculum version are listed on the left-hand side of the table. The corresponding equivalent courses in the new curriculum version of the Master's Degree Programme Biotechnology are listed on the right-hand side of the table. Any courses of the expiring curriculum that have no equivalent course according to this list may be taken as free-choice subjects.

Courses that have the same name and type, number of ECTS credit points and the number of semester hours are considered to be equivalent and are thus not explicitly listed in the equivalence list.

Curriculum version 2024					Expiring curriculum version 2019				
	Course	Course type	ECTS	SSt		Course	Course type	ECTS	SSt
W4.1	Recent Advances in Environmental Microbiology	SE	2	1.3	W4.2	Environmental Microbiology	SE	2	1.3
W5.3	Sensory Evaluation of Food	VU	2	2	W5.3	Sensory Analysis of Biotechnologically Produced Food	VU	2	2
W5.6	Quality Assurance GMP in Pharmaceutical, Food and Biotechnological Processing	VO	3	2	W4.1	Quality Assurance GMP in Pharmaceutical, Food and Biotechnological Processing	SE	3	2
W4.5	Microbiome in Health and Environment	VO	2	1.5	W4.6	Microbiome in Health and Environment	VO	2	1.3
E.1	Research in Biotechnology	SE	1	1		No equivalency			
W4.7	Climate Change and Microbiomes	VU	2	2		No equivalency			
W6.9	Professional Research Practice		1.5–6			No equivalency			
W6.10	Good Scientific Practice	VO	1.5	1		No equivalency			



(2) Equivalency of courses when remaining in the expiring curriculum version 2019

The courses of the expiring Master's Degree Programme Biotechnology curriculum version 2019 are listed on the left-hand side of the table. On the right side of the table is a list of courses from the curriculum version 2024 that may be completed instead of the courses originally listed in the curriculum if the student wishes to remain in the expiring curriculum and the original courses are no longer offered.

Courses that have the same name and type, number of ECTS credit points and the number of semester hours are considered to be equivalent and are thus not explicitly listed in the equivalence list.

Expiring curriculum version 2019					Curriculum version 2024				
	Course	Course type	ECTS	SSt		Course	Course type	ECTS	SSt
W4.2	Environmental Microbiology	SE	2	1.3	W4.1	Recent Advances in Environmental Microbiology	SE	2	1.3
W5.3	Sensory Analysis of Biotechnologically Produced Food	VU	2	2	W5.3	Sensory Evaluation of Food	VU	2	2