UK 033/663

CURRICULUM FOR THE BACHELOR'S PROGRAM IN **BIOLOGICAL CHEMISTRY.**

Joint Bachelor's Program
in cooperation with
Faculty of Science
University of South Bohemia in Budweis
Czech Republic
(in English)

JOHANNES KEPLER
UNIVERSITY LINZ

Contents

§ 1 Qualification Profile

The cross-border English-language Bachelor's program in "Biological Chemistry" aims to attract international students to educate them to become chemists with a strong focus on biological applications.

(1) The cross-border Bachelor's program is offered jointly by the Faculty of Engineering and Natural Sciences (TNF) of the Johannes Kepler University Linz (JKU) in Austria and by the Faculty of Science (PRF) of the University of South Bohemia (USB) in České Budějovice (Budweis) in the Czech Republic. The program provides a solid foundation in the field of chemistry and natural sciences in general with a focus on those areas of chemistry that are important for the functioning and for the analysis of biological systems, as well as the areas of biology, in which chemical interactions are important.
To achieve the educational objectives a more extensive training in biological subjects, in particular biochemistry, is required by comparison to common study programs of chemistry or chemical engineering. In the area of chemistry this study program based on general principles extends into (bio)inorganic, analytical, (bio)organic and physical chemistry. In the field of biology, after a basic training, the focus is on molecular biology, genetics and bio-analytical issues. In-depth training in English as a technical language is provided implicitly through the use of English as the language of instructions. Students can obtain additional language training in a language that is not their native language (e.g.: Czech or German for non-native speakers of these languages).

(2) The two universities provide complementary competences for the study program. The Faculty of Engineering and Natural Sciences of JKU contribute their expertise mainly in chemistry, (bio)physics, and mathematics. The Faculty of Science of USB focus on the biological disciplines, in particular biochemistry, molecular biology and genetics.

(3) Throughout the Bachelor's program the principle of research-supported learning and research-led teaching are realized, as far as possible in practical laboratory courses. This is to ensure that, based on the necessary and properly selected factual knowledge, the graduates of the curriculum of Biological Chemistry will be acquiring academic understanding and the problem-solving skills, which are required to deal with complex interdisciplinary problems and to keep up with the rapid development of the discipline of Biological Chemistry.

(4) The Bachelor's program prepares students not only for those numerous application-oriented professional fields in which Biological Chemists will work today and increasingly in the future, but also for tasks in fundamental research at public and private research institutions, especially in international environments. Some examples are biomedical, pharmaceutical and biotechnological research, biochemical and environmental analysis, medical and diagnostic laboratories as well as public administration, regulation agencies and international research organizations.

(5) The successful graduation with a double degree in Biological Chemistry as Bachelor of Science (BSc, in Austria) and Bachelor (Bc, in the Czech Republic) enables the alumni to enter a qualified professional activity, for example as laboratory managers or project and research assistants. Due to the international nature of the curriculum and the English language of instruction the graduates are particularly qualified for professions in a multi-national environments (e.g.: EU institutions, international companies and agencies).

(6) During this Bachelor's program, in addition to scientific and technical expertise, social competence and the ability to interact with superiors, peers and subordinates in an international multilingual environment are acquired through teamwork, especially in the practical courses. The readiness for cross-border interaction, inter-cultural communication and interdisciplinary thinking will be stimulated and developed. The Bachelor's program "Biological Chemistry" thus also contributes

to personality formation and the development of social skills in order to prepare the graduates for cooperation in multinational interdisciplinary teams.

§ 2 Structure and Outline

(1) In accordance with § 54 para. 1 UG the Bachelor's program in "Biological Chemistry" belongs to the category of degrees in natural sciences and is taught in English.

(2) The Bachelor's program in "Biological Chemistry" is a joint study program of the Johannes Kepler University (JKU) and the University of South Bohemia (USB). The Bachelor's program covers six semesters and consists of 180 ECTS points, which are distributed among the following subjects:

Subjects	ECTS
Mandatory Subjects	159
Bachelor's Theses	10
Bachelor's Examination	2
Free Electives	9
Total	180

(3) The courses taught at the Johannes Kepler University Linz are mainly in the first, second and 5th Semester of the bachelor's program. For organizational reasons deviations from the recommended semester schedule are possible.

(4) For Free Electives students have to pass examinations corresponding to 9 ECTS points, which can be chosen from any recognized national or international post-secondary educational institution. The Free Electives shall provide additional skills beyond the Bachelor's program in Biological Chemistry and can be taken anytime during the Bachelor's study.

(5) The recommended course of study is listed in the annex 1.

§ 3 Studies Introductory and Orientation Phase

(1) According to § 66 para. 1 UG the studies introductory and orientation phase consists of courses which give an overview of the fundamental contents and structure of the corresponding curriculum of studies. The studies introductory and orientation phase of the Bachelor's program in Biological Chemistry covers courses amounting to 8 ECTS points in total, which can be chosen out of the following list:

Code	Type of course	Name	ECTS winter term	ECTS summer term
290GICHIGCV18	VL	Introduction to General Chemistry	3	
290ANCHIACV18	VL	Introduction to Analytical Chemistry	3	
290OPCHIOCV18	VL	Introduction to Organic Chemistry	3	

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Code	Type of course	Name	ECTS winter term	ECTS summer term
290GICHIC1V18	VL	Inorganic Chemistry I	4,5	
290GESKCLSK18	KV	Chemical Laboratory Safety	1	
290ANCHANCV18	VL	Analytical Chemistry		4,5
663ORCHOCHV18	VL	Organic Chemistry 1 for Biological Chemistry		4,5
663MOBIITGV13	VL	Introduction to Genetics		1,5
290PHCHCTDK18	KV	Chemical Thermodynamics		1,5

(2) Before completion of the studies introductory and orientation phase further courses to an extent of 22 ECTS points can be chosen out of the following list:

Code	Type of course	Name	ECTS winter term	ECTS summer term
290GICHILCP18	PR	Introductory Lab Course (*)	2	
290GICHCCAK18	KV	Chemical Calculations	3	
GS-ISE	KV	Introduction into Gender Studies in Science and Engineering	3	
663MAPHIMAK19	KV	Introduction to Mathematics	1,5	
663MAPHMA1V18	VL	Mathematics for Biological Chemistry 1	3	
663MAPHMA1U18	UE	Applications of Mathematics in Biological Chemistry 1	3	
663MAPHPH1K18	KV	Physics 1 for Biological Chemistry	1,5	
290GICHLGCP18	PR	Lab Course in General Chemistry (*)		2

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Code	Type of course	Name	ECTS winter term	ECTS summer term
663ANCHLACP19	PR	Lab Course in Analytical Chemistry for Biological Chemists (*)		5
663MAPHPH2V18	VL	Physics 2 for Biological Chemistry		3
663MAPHPHYU16	UE	Exercises in Physics for Biological Chemistry		1,5
663MAPHMA2V18	VL	Mathematics for Biological Chemistry 2		3
663MAPHMA2U18	UE	Applications of Mathematics in Biological Chemistry 1		1,5

(*) This course has pre-requisites.

(3) For students, who within the curricula of the

1. Bachelor’s program Fundamentals of Natural Sciences for Technology at JKU
2. Bachelor’s program Chemistry at JKU
3. Bachelor’s program Technical Chemistry at JKU
4. Bachelor’s program Technische Chemie at the Vienna University of Technology
5. Bachelor’s program Chemie at the University of Vienna
6. Bachelor’s program Chemie at the Graz University of Technology or the University of Graz
7. Bachelor’s program Chemie at the University of Innsbruck

have successfully completed the studies introductory and orientation phase in accordance with the relevant legal provisions and who, therefore, by the time of admission to the Bachelor’s program in "Biological Chemistry" at JKU were entitled to complete the further courses, examinations and bachelor’s theses in accordance with § 66 para. 2 UG in the respective curriculum, the studies introductory and orientation phase of the degree program shall be deemed to have been successfully completed even without positive results in the particular courses referred to in para. 1 as part of the studies introductory and orientation phase for the Bachelor’s program in „Biological Chemistry“ at JKU. This does not imply recognition of the examinations passed in the course of studies in accordance with subpara. 1 to 7 for the examinations defined in para. 1 as part of the studies introductory and orientation phase for the Bachelor’s program at JKU. If there is no recognition in accordance with § 78 UG, the respective course examinations must be successfully completed separately.

§ 4 Mandatory Subjects/Modules

All courses and modules of the Mandatory Subjects have to be completed successfully:

Code	Name	ECTS
663GICH18	General and Inorganic Chemistry	14,5
663ANCH18	Analytical Chemistry	17,5
663ORCH18	Organic Chemistry	17,5
663MAPH18	Mathematics and Physics	25,5
663GESK18	General Skills	7
663PHCH18	Physical Chemistry	11,5
663MOBI18	Molecular Biology	11,5
663BICH18	Biochemistry	29
663BIOL14	Biology	16
663INFO18	Informatics	9

§ 5 Courses

(1) The names and the types of all courses of the Mandatory subjects taught at the Johannes Kepler University (JKU), as well as their ECTS points, their duration in hours per week, their codes, their registration requirements, and their admission procedures (in case of limited availability of places) are described in the study handbook of JKU (studienhandbuch.jku.at).

(2) The possible types of courses as well as the examination regulations are described in §§ 13 and 14 of the JKU statute (Section "Studienrecht").

(3) For courses taught at the University of South Bohemia, the regulations of the University of South Bohemia apply.

§ 6 Replacement of Subjects and Courses

Courses according to § 5 (1) at JKU may be replaced to a total extent of 9 ECTS points by other study specific subjects and courses upon student’s request, provided that the purpose of academic professional preparatory training is not affected and the choice of the proposed courses seems reasonable with regard to the defined aims in the qualification profile, the academic context as well as to the addition to the professional preparatory training. The application of replacing subjects and courses has to be filed by the Vice Rector of Academic Affairs at JKU.

§ 7 Bachelor's Thesis

(1) Students of the Bachelor's program in "Biological Chemistry" must complete two bachelor's theses according to § 80 UG in the course SE "Bachelor's Seminar Biological Chemistry JKU" (663BAARBSBS18) und SE "Bachelor Thesis Biological Chemistry SBU (including Bachelor's Seminar)" (ANTBATHBICS18), where in each case one bachelor's thesis at Johannes Kepler University and one bachelor's thesis at the University of South Bohemia must be performed. At least one of the bachelor's theses should involve practical work on a research project.

(2) The Bachelor's theses can be completed starting with the 4th Semester and the bachelor's theses have to be written and presented in English.

(3) The Bachelor's thesis submitted at the Johannes Kepler University will be graded in combination with the Bachelor's Seminar by the teachers of this course. Examination regulations of the University of South Bohemia apply for the Bachelor's thesis submitted at the University of South Bohemia.

(4) The Curricular Committee for Biological Chemistry may specify guidelines for the formal structure of a Bachelor's thesis.

(5) The topics of the Bachelor's theses have to be documented in the certificate.

§ 8 Examination Regulations

(1) The regulations for subject examinations and course examinations performed at JKU are described in the study handbook of JKU (studienhandbuch.jku.at).

(2) The Bachelor's program in „Biological Chemistry“ is concluded by a Bachelor's Examination, which consists of the successful completion of the mandatory subjects according to § 4 and the State Exam at USB (2 ECTS). In order to graduate students must also receive a passing grade for their Bachelor's theses als well as for the free electives examinations.

(3) The Examination regulations of the University of South Bohemia (USB) apply for examinations at the University of South Bohemia.

(4) Students of this curriculum are eligible for examinations of courses at the partner university, even if they did not attend courses at this university during the current semester.

(5) In order to graduate, students must receive passing grades for both Bachelor's degree theses and the State Exam at USB as well as successfully pass the mandatory subject examinations (§ 4) and the examinations in the free electives.

(6) The following conversions are used to translate grades from the University of South Bohemia (USB):

Grades at USB	Grades at JKU
excellent 1	sehr gut 1
excellent minus 1–	sehr gut 1
very good 2	gut 2
very good minus 2–	befriedigend 3
good 3	genügend 4
unsatisfactory 4	nicht genügend 5

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Grades at USB	Grades at JKU
successful participation	mit Erfolg teilgenommen
unsuccessful participation	ohne Erfolg teilgenommen

(7) The following conversion is used to translate grades from the Johannes Kepler University Linz (JKU):

Grades at JKU	Grades at USB
sehr gut 1	excellent 1
gut 2	very good 2
befriedigend 3	very good minus 2–
genügend 4	good 3
nicht genügend 5	unsatisfactory 4
mit Erfolg teilgenommen	successful participation
ohne Erfolg teilgenommen	unsuccessful participation

(8) For the purpose of assigning grades in the certificate, above conversion of grades of the University of South Bohemia (para. 5) will be used for subjects completed at the University of South Bohemia (USB).

§ 9 Academic Degree

(1) Graduates of the Bachelor's program in "Biological Chemistry" are awarded the academic degree „Bachelor of Science“, abbreviated „BSc“ or „BSc (JKU)“ at the Johannes Kepler University Linz and the academic degree "Bachelor", abbreviated „Bc“ at the University of South Bohemia.

(2) The certificate of the Austrian academic degree is issued in German and in English translation.

(3) The certificate has to express that the Bachelor's program in "Biological Chemistry" is a joint study program of the Johannes Kepler University and the University of South Bohemia.

§ 10 Legal Validity

(1) This curriculum comes into effect on October 1, 2018.

(2) The curriculum of the Bachelor's program „Biological Chemistry“ in the version published in the official newsletter of the Johannes Kepler University Linz on June 23, 2017, 33rd piece, item 251 expires by the end of September 30, 2018 with the exception of the transitional arrangements, unless otherwise specified below.

(3) § 2 para. 1, § 3 para. 1 and 2 and Annex 1 as published in the official newsletter of the Johannes Kepler University Linz on June 24, 2019, 33rd piece, item 464 will take effect on October 1, 2019.

§ 11 Transitional Arrangements

(1) Students already enrolled in the Bachelor's program 2014 in the currently valid version as before October 1, 2018 are entitled to continue with this program until September 30, 2019. However, from winter term 2018/19, semesters 1 - 4 of the suggested order of study will be governed by the curriculum introduced on October 1, 2018. Any courses no longer offered from the Bachelor's program 2014 in the currently valid version must be substituted with the equivalent courses as listed in the study handbook. Students who do not complete the Bachelor's program 2014 in the currently valid version by September 30, 2019, will automatically be subject to completing the program in accordance to the Bachelor's program 2018 taking para. 2 and para. 4 into account.

(2) In order to compensate for the split and shift of contents of Physical Chemistry 1 (5.2 ECTS) in the previous curricula to two new courses, Chemical Thermodynamics (1.5 ECTS) and Physical Chemistry 1 (4.5 ECTS), the course Physical Chemistry 1 (5.2 ECTS) according to the previous curriculum version is offered in the winter terms 2018/19 and 2019/20.

(3) Students enrolled in the Bachelor's program 2014 in the currently valid version can opt for switching to the Bachelor's program 2018 taking para. 2 and 4 into account.

(4) For students who have passed examinations within the curriculum of the Bachelor's program in "Biological Chemistry" in a previous version, the equivalences listed in the study handbook of JKU (studienhandbuch.jku.at) apply. In addition to the equivalences given in the study handbook of JKU the following equivalences are effective:

Package of subjects in the Bachelor Biological Chemistry version of 2017	**equivalent package of subjects in the Bachelor Biological Chemistry version of 2018**
663AACH14: General and Inorganic Chemistry (15,8 ECTS) 663ANCH14: Analytical Chemistry (18,6 ECTS) 663ORCH16: Organic Chemistry (13,7 ECTS)	663GICH18: General and Inorganic Chemistry (14,5 ECTS) 663ANCH18: Analytical Chemistry (17,5 ECTS) 663ORCH18: Organic Chemistry (17,5 ECTS)
663MAPH16: Mathematics and Physics (23,3 ECTS) 663KOET14: Communication and Ethics (10,8 ECTS)	663MAPH18: Mathematics and Physics (25,5 ECTS) 663GESK18: General Skills (7 ECTS)
663PHCH14: Physical Chemistry (11,6 ECTS)	663PHCH18: Physical Chemistry (11,5 ECTS)
663BICH14: Biochemistry (31 ECTS) 663MOBI14: Molecular Biology (8,5 ECTS)	663BICH18: Biochemistry (29 ECTS) 663MOBI18: Molecular Biology (11,5 ECTS)
663BAAR14: Bachelor's Theses (10,7 ECTS)	663BAAR18: Bachelor's Theses (10 ECTS)

Annex 1: Global map of study subjects - Bachelor's Program "Biological Chemistry" (2019)

1st Semester (WS)		2nd Semester (SS)		3rd Semester (WS)		4th Semester (SS)		5th Semester (WS)		6th Semester (SS)	
JKU Linz		**JKU Linz**		**USB Budweis**		**USB Budweis**		**JKU Linz**		**JKU Linz/USB Budweis**	
Subject/Course	**ECTS**	**Subject/Course**	**ECTS**	**Module**	**ECTS**	**Subject/Module**	**ECTS**	**Subject/Course**	**ECTS**	**Subject/Module/Course**	**ECTS**
General and Inorganic Chemistry Introduction to General Chemistry Chemical Calculations Introductory Lab Course Inorganic Chemistry I	12,5	**General and Inorganic Chemistry** Lab Course in General Chemistry	2	**Biochemistry 1**	4	**Biochemistry 2**	4	**Analytical Chemistry** Instrumental Analytical Chemistry Lab Course of Instrumental Analysis for Biological Chemistry	5	**Mathematics and Physics** Biophysics Laboratory for Biological Chemistry	3
				Biochemistry Laboratory 1	3	**Biochemistry Laboratory 2**	5				
		Analytical Chemistry Analytical Chemistry Lab Course in Analytical Chemistry for Biological Chemists	9,5	**Biology of Animals**	3	**Biology of Plants**	3	**Informatics** Sequence analysis and phylogenetics Exercises in Bioinformatics for Biological Chemistry & Molecular Biology	6	**Physical Chemistry** Lab Course in Physical Chemistry for Biological Chemistry	4
				Biology of Microorganisms	4	**WHO/EU laboratory procedure administration**	3				
Analytical Chemistry Introduction to Analytical Chemistry	3	**Organic Chemistry** Organic Chemistry 1 for Biological Chemistry	4,5	**Biological Chemical Elective subject**	3	**Academic Writing for Cross Border Studies**	3			**Bachelor's Theses** Bachelor's Seminar Biological Chemistry JKU (Including Bachelor Thesis) Bachelor Thesis Biological Chemistry SBU (including Bachelor's Seminar) (USB Budweis)	10
						Introduction to Genomics	3				
Organic Chemistry Introduction to Organic Chemistry	3	**Molecular Biology** Introduction to Genetics	1,5	**Biological Chemistry Project 1**	1	**Biological Chemistry Project 2**	1	**Mathematics and Physics** Biophysics	3		
General Skills Chemical Laboratory Safety Introduction into Gender Studies in Science and Engineering	4	**Physical Chemistry** Chemical Thermodynamics	1,5	**Introduction to Cell Biology**	1	**Biomolecular NMR spectroscopy**	3	**Organic Chemistry** Laboratory Course of Preparative Organic Chemistry for Biological Chemistry 1 In-depth fundamentals of Preparative Organic Chemistry for Biological Chemistry Interpretation of NMR Spectra and Structure Elucidation of Organic Molecules	9		
Mathematics and Physics Introduction to Mathematics Mathematics for Biological Chemistry 1 Applications of Mathematics for Biological Chemistry 1 Physics 1 for Biological Chemistry	9	**Mathematics and Physics** Mathematics for Biological Chemistry 2 Applications of Mathematics for Biological Chemistry 2 Physics 2 for Biological Chemistry Exercises in Physics for Biological Chemistry	10,5	**Biostatistics**	5	**Introduction to Bioinformatics**	3			**State Examination** (USB Budweis)	2
				Methods in Molecular Biology	4	**Biogeochemistry**	2			Free Electives	9
				Molecular Biology and Genetics I	3	**Repetitorium in Organic Chemistry**	1	**Physical Chemistry** Physical Chemistry for Biological Chemistry I Exercises in Physical Chemistry for Biological Chemistry I	6		
	31,5		**29,5**		**31**		**31**		**29**		**28**
										Total	180