UNIVERSITÄT BERN

Plan of Studies for the Chemistry and Molecular Sciences Study Programs of the Department of Chemistry and Biochemistry

of 13 December 2018

The Faculty of Science,

in accordance with Article 44 of the University of Bern Statutes of 7 June 2011 (University Statutes, UniSt), the Regulations governing the studies and assessments at the Faculty of Science of 24 May 2018 (study regulations Faculty of Science [RSL Phil nat. 18]) and the PhD Regulations of the Faculty of Science of the University of Bern dated 23 May 2019 (PromR Phil. nat. 19),

issues the following Plan of Studies:

I. General information

SCOPE OF APPLICATION

Art. 1 This plan of studies applies for all students who study chemistry and molecular sciences at the Faculty of Science, or for those who make use of the chemistry and molecular sciences offering in connection with a different study program.

STUDY PROGRAMS

Art. 2 The Department of Chemistry and Biochemistry offers the following study programs:

a Bachelor's Study Program for Chemistry and Molecular Sciences (Mono 180 ECTS credits)

b Bachelor's Study Program for Chemistry and Molecular Sciences (Minor 60 ECTS credits)

c Bachelor's Study Program for Chemistry and Molecular Sciences (Minor 30 ECTS credits)

d Bachelor's Study Program for Chemistry and Molecular Sciences (Minor 15 ECTS credits)

e Master's Study Program for Chemistry and Molecular Sciences (Mono 90 ECTS credits)

f Master's Study Program for Chemistry and Molecular Sciences (Minor 30 ECTS credits)

g PhD Program for Chemistry and Molecular Sciences (30 ECTS credits).

DEGREES

Art. 3 The following degrees may be earned:

a Bachelor of Science in Chemistry and Molecular Sciences, University of Bern (BSc),

b Masters of Science in Chemistry and Molecular Sciences, University of Bern (MSc),

c PhD in Chemistry and Molecular Sciences, University of Bern.

ECTS CREDITS AND LEARNING OUTCOMES

Art. 4 The number of ECTS credits and the learning outcomes for the individual courses are defined in the electronic course catalogue and in the Appendix.

STANDARD DURATION OF STUDY & EXTENSION OPTIONS

Art. 5 Article 12 RSL Phil. Nat. 18 applies for the standard study periods and extension options.

MODULES

Art. 6 [1] The courses are organized into modules as described in the Appendix.

[2] The units of credit within the modules are individually tested by means of assessments.

[3] A module's final grade is calculated according to the ECTS-weighted average of the units of credit earned.

ASSESSMENTS

Art. 7 [1] The type of assessment (e.g. written or oral exam) is specified in the electronic course catalogue. The timing and procedures of the assessments are determined and announced by the directorate of studies, in consultation with the lecturers.

[2] The duration of oral exams is set out in Article 22 Para. 4 RSL Phil. Nat. 18, and the duration of written exams is determined according to Article 23 Para.1 RSL Phil. Nat. 18. Details can be found in the Appendixes or in the electronic course catalogue.

[3] The conditions for participation in assessments are defined in the electronic course catalogue.

[4] The persons responsible for the exams must register the results of the written assessments within a period of one month (Article 23 Para. 2 RSL Phil. Nat. 18).

[5] The publication of exam results is governed by Article 35 RSL Phil. Nat. 18. Students may consult the documents up to one month following the announcement of a result.

[6] Furthermore, Articles 20 to 40 of the RSL Phil. Nat. 18 apply .

REGISTRATION & WITHDRAWAL FROM ASSESSMENTS

Art. 8 [1] Article 32 RSL Phil. Nat. 18 applies for the assessment registration and withdrawal procedures.

[2] Should a candidate leave an assessment early or not show up for an assessment, he or she must provide proof of an important reason (e.g. a medical certificate) within one week. Otherwise, the assessment is considered failed and given a grade of 1.

LANGUAGES

Art. 9 Lab courses may be conducted in German or English.

RESPONSIBILITY FOR ASSESSMENTS

Art. 10 [1] Only authorized lecturers for the relevant course are eligible to act as examiners.

[2] The lecturers of the respective unit of credit are responsible for the organization and execution of assessments.

[3] The directorate of studies verifies that the admission requirements for the corresponding assessment are met.

GRADING

Art. 11 [1] Article 34 RSL Phil. Nat. 18 applies for the awarding of grades.

[2] Ungraded assessments are evaluated in accordance with Article 34, Para. 2, RSL Phil. Nat. 18.

[3] The electronic course catalogue regulates which assessments are graded.

REPETITION & COMPENSATION

Art. 12 [1] Failed assessments may be repeated once. The repetition must be completed during the academic year following the first exam. An extension of this period may only be made due to important grounds under Article 35 of the University Ordinance (UniV) of 12 September 2012 and must be requested in writing from the directorate of studies no later than one month before the last possible exam date. An extension due to unforeseeable reasons must be requested in writing no later than one day before the last possible exam date.

[2] As a rule, repetitions are implemented in the same manner as the original assessment. The responsible examiners may decide to replace a written test with an oral exam lasting 15 to 60 minutes. In this case, the new format must be communicated to the student at least one week in advance.

[3] A bachelor's or master's thesis receiving an insufficient grade may be replaced one time by a thesis on another topic. The candidate has the right to complete the second bachelor's or master's thesis under the direction of another lecturer.

[4] If the module itself can be passed, failed grades may be compensated with passing grades as follows:

a In the first year of the Bachelor's Study Program for Chemistry and Molecular Sciences module (180 ECTS credits), a maximum of three insufficient grades may be compensated.

b In all other modules, all insufficient grades may be compensated by others within the same module (Article 38 Para. 1 RSL Phil. Nat. 18).

[5] Compensation is only possible within the Bachelor's Study Programs when all inadequate assessments of a module have been repeated. The grade of the second exam applies.

[6] A bachelor's or master's thesis may not be compensated.

LABORATORY WORK & LABORATORY COURSES

Art. 13 [1] The person responsible for the laboratory, the credit course or the lab course may temporarily exclude students who do not follow the professional instructions of the supervisor when working in the laboratory or on a lab course. This also applies to behavior which endangers the students themselves, or the physical or mental integrity of others.

[2] The responsible person referred to in point 1 shall report the incident to the Dean, who will then decide on any disciplinary measures (Article 47 UniV).

ACADEMIC STUDENT ADVISORY SERVICE

Art. 14 The directorate of studies provides student advisory services in the form of information presentations and consultation appointments.

UNIVERSITY GENERAL ELECTIVE CREDITS

Art. 15 Selected units of credit may be offered as general elective courses and include an assessment. These are listed as such in the electronic course catalogue.

II. Bachelor's Study Program

1. Bachelor's Study Program for Chemistry and Molecular Sciences (Mono 180 ECTS credits)

DEGREE PROGRAM OBJECTIVES

Art. 16 The graduates are familiar with the theoretical and practical foundations of physical chemistry, organic chemistry and biochemistry and other relevant subjects. They can utilize and apply the basics of chemistry and molecular sciences and implement them to practical work.

They understand concepts and principles related to chemical matters, can analyze them interdisciplinary and apply what they've learned to new content and situations.

They are able to familiarize themselves with various topics of physical chemistry, organic chemistry and biochemistry by means of independent literature studies, to describe the central themes and to infer and derive other concepts and principles.

They are able to conduct a scientific discourse in a professionally competent and formally correct manner and to comprehensibly present material (both in form and content) to a specialist audience.

In addition, they are able to carry out a small research project with professional guidance and to answer chemical-related questions using a theoretical and practically competent approach. They can interpret research results and present them to a specialist audience in a correct, formal and comprehensive manner.

STRUCTURE

Art. 17 The study program includes an introductory academic year consisting of 60 ECTS credits and a main course of study totaling 120 ECTS credits.

CREDITS

Art. 18 [1] The study program consists of the following compulsory credits:

a Introductory year

- Introductory academic year module (details listed in Appendix)

b Main course of study:

- Second academic year module: Lectures (details listed in Appendix)
- Second academic year module: Lab courses (details listed in Appendix)
- Third academic year module: Lectures (details listed in Appendix)
- Third academic year module: Lab courses (details listed in Appendix)
- Bachelor 's thesis (10 ECTS credits)

[2] The allocation of ECTS points for each unit of credit, as well as possible groupings into modules, are defined in the Appendix.

[3] The lab courses and assessments for third year units of credit may not be attended or assessed unless the ECTS credits of the introductory academic year have been fully earned.

BACHELOR'S THESIS

Art. 19 [1] Phil. Nat. 18. Articles 27 to 31 and Articles 42 and 43 RSL Phil. Nat. 18 apply for the bachelor's thesis.

[2] The bachelor's thesis is completed in the sixth semester in connection with one of the Department of Chemistry and Biochemistry's research groups. It includes research work and is completed with a report.

[3] Bachelor's thesis are graded within four weeks following submission and results reported to the directorate of studies by the supervisor.

[4] A copy of the bachelor's thesis must be submitted to both the supervisor and the directorate of studies secretariat of Chemistry and Molecular Sciences.

PASSING STANDARDS

Art. 20 The study program is considered "passed" when:

a the modules according to Article 18 have been completed and

b in the case of insufficient grades, the conditions for compensation referred to in Article 12 have been met and

c the bachelor's thesis is awarded a minimum grade of 4.0.

GRADES

Art. 21 Article 45 RSL Phil. Nat. 18 applies for the bachelor's degree grade.

2. Bachelor's Study Program for Chemical and Molecular Sciences (Minor 60 ECTS credits)

DEGREE PROGRAM OBJECTIVES

Art. 22 The graduates are familiar with the theoretical and practical foundations of physical chemistry, organic chemistry and biochemistry and other relevant subjects.

They understand concepts and principles related to chemical matters, can analyze them interdisciplinary and apply what they've learned to new content and situations.

They are able to familiarize themselves through independent literature studies with various subject matter relating to physical chemistry, organic chemistry and biochemistry; to describe central themes and to derive other concepts and principles based on their knowledge.

They are able to conduct a scientific discourse in a professionally competent and formally correct manner and to comprehensibly present material (both in form and content) to a specialist audience.

CREDITS

Art. 23 The study program consists of the following compulsory credits:

a Compulsory credits:

- Introductory academic year module (details listed in Appendix)

b Compulsory optional credits:

- Advanced lecture course module (details listed in Appendix)
- Advanced lab course module (details listed in Appendix)

PASSING STANDARDS

Art. 24 The study program is considered "passed" when:

a the modules according to Article 23 have been completed and

b in the case of insufficient grades, the conditions for compensation referred to in Article 12 have been met.

GRADES

Art. 25 Article 46 Para. 2 RSL Phil. Nat. 18 applies for the study program grade.

3. Bachelor's Study Program, Chemistry and Molecular Sciences (Minor 30 ECTS credits)

DEGREE PROGRAM OBJECTIVES

Art. 26 The graduates are familiar with the theoretical and practical foundations of physical chemistry, organic chemistry and biochemistry and other relevant subjects.

They understand concepts and principles related to chemical matters, can analyze them interdisciplinary and apply what they've learned to new content and situations.

They are able to familiarize themselves through independent literature studies with various subject matter relating to physical chemistry, organic chemistry and biochemistry; to describe central themes, and to derive other concepts and principles based on their knowledge.

CREDITS

Art. 27 The study program consists of the following credits:

a Compulsory credits:

- Introductory academic year module (details listed in Appendix)

b Compulsory optional credits:

- Advanced lecture course module (details listed in Appendix)
- Advanced lab course module (details listed in Appendix)

PASSING STANDARDS

Art. 28 The study program is considered "passed" when:

a the modules according to Article 27 have been completed and

b in the case of insufficient grades, the conditions for compensation referred to in Article 12 are met.

GRADES

Art. 29 Article 46 Para. 2 RSL Phil. Nat. 18 applies for the study program grade.

4. Bachelor's Study Program for Chemistry and Molecular Sciences (Minor 15 ECTS credits)

DEGREE PROGRAM OBJECTIVES

Art. 30 The graduates are familiar with the theoretical and practical foundations of physical chemistry, organic chemistry and biochemistry and other relevant subjects.

They understand concepts and principles related to chemical matters, can analyze them interdisciplinary and apply what they've learned to new content and situations.

CREDITS

Art. 31 The study program consists of the following compulsory credits:

a Introductory academic year module (15 ECTS credits)

PASSING STANDARDS

Art. 32 The study program is considered "passed" when:

a. the modules according to Article 31 have been completed and

b. in the case of insufficient grades, the conditions for compensation referred to in Article 12 have been met.

GRADES

Art. 33 Article 46 Para. 2 RSL Phil. Nat. 18 applies for the study program grade.

III. Master's Study Program

1. Master's Study Program for Chemistry and Molecular Sciences (Mono 90 ECTS credits)

DEGREE PROGRAM OBJECTIVES

Art. 34 This study program deepens the knowledge acquired in the bachelor's study program and expands the acquired skills in chemistry and molecular sciences. Graduates are able to transfer what they have learned onto existing (known or novel) chemical problems.

They can identify and formulate scientific and practice-oriented problems, independently develop the existing research content, answer novel questions on the problem with a theoretically and methodically competent approach and work out possible solutions. They are able to present the results to a specialist audience, both in terms of form and content.

As part of master's thesis research, they can carry out a selected chemical research project (equaling 60 ECTS credits) independently and completely, with the help of expert supervision. They are able to formulate the research goal, define research questions and prepare a research plan to answer them with the appropriate experimental approaches. They can collect, evaluate and interpret relevant data in detail by means of technically and formally competent working methods. The experiments carried out in the research work and the knowledge gained from them are recorded in a master's thesis.

They are able to present the results in the form of an oral, scientific presentation to a specialist audience in a correct and appropriate manner.

They can assess the significance of their theoretical and methodological knowledge and skills for the field of science and chemistry practices, and are able to apply it to solve complex interdisciplinary problems in theory and practice.

ADMISSION

Art. 35 [1] In addition to the general admission conditions of the University of Bern, admission requirements for the study program are:

a a bachelor's degree in either chemistry or biochemistry from a Swiss university; or

b a bachelor's degree from a Swiss higher educational institution in another field of study with at least 60 ECTS Credits in the field of chemistry or biochemistry, provided that the conditions for successfully completing a master's degree can be fulfilled by earning a maximum of 60 additional ECTS Credits,

c a bachelor's degree from a recognized foreign university with equivalent qualifications, provided that the conditions for successfully completing a master's degree can be fulfilled by earning a maximum of 60 additional ECTS Credits.

[2] Admission of students with a bachelor's degree from a University of Applied Sciences (Fachhochschule) is governed by the relevant regulation issued by the Executive Board of the University of Bern.

[3] Further knowledge and skills may be required that have not been acquired in the bachelor's degree program. These additional credits will be defined individually in the form of conditions (Para. 1 b & c) and / or additional requirements (Para. 1 a-c, Para. 2). The corresponding ECTS credits are shown separately as additional credits in the Diploma Supplement. Further details are regulated by Article 49 f. RSL Phil. Nat. 18.

[4] Applicants with foreign educational qualifications must present evidence at time of enrollment of a completed English language test with a passed Common European Framework of Reference level of B2. Accepted exams include: Cambridge Certificates, a valid TOEFL, or IELTS. The language exam may not be older than two years, older tests will not be accepted.

Language test	Minimum grade
TOEFL Paper	513
TOEFL Internet	72
IELTS	5
or	
Cambridge First Certificate in English (FCE)	

please see further language tests according to www.europaeischer-referenzrahmen.de

[5] A dispensation from the English test is possible for students who completed their studies in a community where the majority of residents speak English as the primary language.

MAJOR FIELD OF STUDY

Art. 36 The study program can be completed without (general chemistry), or with one or two of the following five specializations:

a Chemical Biology

b Sustainable Chemistry

c Advanced Synthesis

d Nuclear- and Radiochemistry

e Spectroscopy of Materials

CREDITS

Art. 37 [1] The study program consists of the following compulsory credits:

a Compulsory credits:

– Master's thesis (60 ECTS credits)

b Compulsory optional credits:

– Core subject courses module (details listed in Appendix)

– Electives module (details listed in Appendix)

[2] If the study program is selected with a specialization, at least 12 ECTS credits from the core subject courses module of the relevant specialization must be earned.

[3] The allocation of ECTS credits for any unit of credit and groupings into modules, as well asspecializations, are specified in the Appendix.

MASTER'S THESIS

Art. 38 [1] Articles 27-31 and Articles 51-53 RSL Phil. Nat. 18 apply for the master's thesis.

[2] All additional requirements, including a bachelor's degree, must be completed successfully before starting on a master's thesis.

[3] A master's thesis usually takes 12 months to complete. The directorate of studies must be informed in writing about work beginning for a master's thesis. In cases where a master's program is started in the autumn semester, the thesis work usually starts on the following 1 January at the earliest and on 31 January at the latest. If the program is started in the spring semester, the master's thesis usually begins between the following 1 - 31 July.

[4] A master's thesis is supervised by one or more lecturers according to Article 21 RSL Phil. Nat. 18.

[5] A copy of the master's thesis must be submitted to the supervisor, the Dean's office and the directorate of studies secretariat of the Department of Chemistry and Molecular Sciences.

PASSING STANDARDS

Art. 39 The study program is considered "passed" when:

a the modules according to Article 37 have been completed,

b in the case of insufficient grades, the conditions for compensation according to Article 12 are met,

c any additional credits have received a passing grade and

d the master's thesis has been awarded a minimum grade of 4.0.

GRADE

Art. 40 Article 55 RSL Phil. Nat. 18 applies for the master's degree grade.

2. Master's Plan of Studies Chemistry and Molecular Sciences (Minor 30 ECTS credits)

DEGREE PROGRAM OBJECTIVES

Art. 41 This study program deepens the knowledge acquired in the bachelor's study program and expands the acquired skills in chemistry and molecular sciences.

The graduates are able to transfer what they have learned to existing (known or novel) chemical questions.

They are able to identify and formulate scientific and practice-oriented problems, independently develop existing research content, answer new questions on the problem using a theoretically and methodically competent approach and create innovative solutions. They can also formally and comprehensibly present the results (both in form and content) to a specialist audience.

ADMISSION REQUIREMENTS

Art. 42 [1] In addition to the general admission conditions of the University of Bern, admission requirements for the study program are:

a A bachelor from a Swiss university with minor (minimum of 60 ECTS credits) in chemistry.

[2] Additional knowledge and skills not been earned in the bachelor's degree program may be required. These additional credits are defined individually in terms of conditions and / or additional requirements. The corresponding ECTS credits are shown separately as additional credits in the Diploma Supplement. Further details are regulated by Article 49f. RSL Phil. Nat. 18.

CREDITS

Art. 43 The study program consists of the following credits:

a Compulsory optional credits:

- Lecture course module (details listed in Appendix)
- Lab course module (details listed in Appendix)

PASSING STANDARDS

Art. 44 The study program is considered "passed" when:

a the modules according to Article 43 have been completed, and

b in the case of insufficient grades, the conditions for compensation referred to in Article 12 are met and

c any additional credits have received a passing grade.

GRADES

Art. 45 Article 56 Phil. Nat. 18 applies for the grade.

IV. PhD Program for Chemistry and Molecular Sciences (30 ECTS credits)

DEGREE PROGRAM OBJECTIVES

Art. 46 The PhD program in chemistry and molecular sciences enables graduates to independently carry out a comprehensive chemical research project on a chosen topic with the help of expertise support and guidance.

They are able to identify and formulate scientific and practice-oriented problems, independently develop existing research content, answer novel questions on the problem using a theoretically and methodically competent approach and create innovative solutions. They are able to determine the research goal, formulate research questions and to draw up a research plan in order to answer them with the appropriate experimental approaches.

They are able to use formally-structured and competent working methods to collect, analyze, interpret and publish relevant data in scientific journals or in the form of a monograph.

They are able to present the results of their research in the form of a scientific oral or poster presentation to an international specialist audience in a correct and appropriate manner.

They can assess the significance of their theoretical and methodological knowledge and skills for the field of science and chemistry practices, and are able to apply it to solve complex interdisciplinary problems in theory and practice.

ADMISSION

Art. 47 [1] Articles 7 and 8 PromR Phil. Nat. 19 apply for the admission requirements.

[2] Admission of students with a master's degree from a University of Applied Sciences is also governed by the relevant university management regulations.

DURATION & SCOPE

Art. 48 [1] The PhD program lasts between three and four years.

[2] It incorporates the successful preparation of a doctoral thesis and the fulfillment of the PhD program requirements.

PHD PROGRAM

Art. 49 [1] The PhD program consists of the following tasks and achievements:

a regular attendance of seminars and conferences (details listed in Appendix),

b active participation in research group seminars (details listed in Appendix),

c active participation in the "First Year Graduate Student Symposium" (details listed in Appendix),

d presentation of own research results at national and international conferences (posters and / or oral presentations) (details listed in Appendix) and

e teaching of bachelor's and master's courses (details listed in Appendix).

[2] The PhD program details are specified in a Doctoral Agreement.

DOCTORAL THESIS

Art. 50 [1] The doctoral work is supervised by authorized persons from the field of chemistry and molecular sciences of the Department of Chemistry and Biochemistry.

[2] The directorate of studies must be notified when doctoral students start work on their dissertation. The directorate of studies reports the beginning of the dissertation to the Dean's office.

SUBMISSION & ASSESSMENT

Art. 51 [1] The doctoral thesis must be submitted to the supervisor and co-referee by the deadline stipulated in the Doctoral Agreement.

[2] Article 20 PromR Phil. Nat. 19. applies for the grading.

DOCTORAL EXAMINATION

Art. 52 [1] The PhD exam consists of a public lecture and an exam portion. It lasts between 60 and 180 minutes.

[2] Article 25 PromR Phil. Nat. 19 applies for the assessment.

WEIGHTING

Art. 53 The overall grade is calculated as 50% from the PhD thesis result and 50% from the PhD exam grades.

DEGREE

Art. 54 Articles 26 and 27 PromR Phil. Nat. 19 apply for the passing of the doctoral degree and the overall dissertation.

COMPULSORY COPIES

Art. 55 [1] One copy of the doctoral thesis must be submitted each to the supervisor, the co-referee, as well as to the directorate of studies secretariat for the Department of Chemistry and Molecular Sciences.

[2] Article 30 PromR Phil. Nat. 19 apply for the compulsory copies.

V. Judicature

APPEALS PROCEDURE

Art. 56 The provisions of the RSL Phil. Nat. 18and the PromR Phil. Nat. 19 apply.

VI. Transitional and Final Provisions

CHANGES TO THE PLAN OF STUDIES

Art. 57 Any revision of the plan of studies are subject to the approval of the university administration. Excluded are amendments to the Appendix, which are the responsibility of Faculty.

TRANSITIONAL PROVISIONS

Art. 58 [1] Students starting their studies at the Department of Chemistry and Biochemistry from the fall semester of 2019 are subject to the present plan of studies.

[2] Students who started their studies according to the 10 March 2016 Plan of Studies for Chemistry and Molecular Sciences will complete their studies according to the 10 March 2016 Plan of Studies.

[3] Students referred to in Para. 2 may request to transfer to this new Plan of Studies.

COMING INTO FORCE

Art. 59 This Plan of Studies replaces the Plan of Studies for Chemistry and Molecular Sciences of 10 March 2016 and enters into force on 1 August 2019.

Bern, 13 December 2018

On behalf of the Faculty of Science
The Dean:

Prof. Dr. Zoltan Balogh

Approved by the university administration:

Bern, 5 March 2019

The Rector:

Prof. Dr. Christian Leumann