



Study and Examination Regulations

Master of Science

Chemistry

Please note that this is an **unofficial translation** of the Study and Examination Regulations.
In case of inconsistency between the German and the English version, the German version of the agreement prevails.

Study and Examination Regulations

AMBI.

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Please note that this is an **unofficial translation** of the Study Regulations for the Consecutive Master's Program in Chemistry from 19 January 2011 (AMBI. TU 9/2011, p. 122ff).

In case of inconsistency between the German and the English version the German version of the agreement prevails.

Study Regulations for the Consecutive Master's Program in Chemistry at Faculty II – Mathematics and Natural Sciences – of Technische Universität Berlin

of 19 January 2011

On 19 January 2011, the Faculty Board of Faculty II – Mathematics and Natural Sciences – adopted the following Study Regulations for the Master's Program in Chemistry, in accordance with Section 71 (1) no. 1 of the Berlin State Higher Education Act (*Berliner Hochschulgesetz – BerlHG*), in the version of 13 February 2003 (Berlin Gazette of Laws and Ordinances [*GVBl.*], page 82), last amended by the Amendment Act of 15 December 2010 (Berlin Gazette of Laws and Ordinances, page 560):

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I. General regulations

Section 1 – Scope of application

(1) These Study Regulations, in conjunction with the Examination Regulations and the current version of the Regulations Governing General Examination Procedures in Undergraduate and Graduate Courses (*AllgPO*) govern the objectives, content and procedure of studies in the Master's Program in Chemistry at Technische Universität Berlin.

Section 2 – Objectives and outline of the program

(1) The Master's Program in Chemistry aims to impart specialized scientific knowledge and practical skills in the field of chemistry. Students shall acquire the ability to carry out independent scientific work, to think critically, and to act responsibly with the goal of becoming qualified to fill a professional position in the field of chemical sciences. Furthermore, they shall be introduced to methods that enable them to acquire scientific knowledge and to address, and solve, problems that arise within the broad field of knowledge encompassed by chemistry. The Master's Program in Chemistry endeavors to provide the foundations for this purpose.

(2) Building on the skills and knowledge acquired during the Bachelor's Program in Chemistry, the Master's Program aims to deepen knowledge of, and to lead to specialization in, the experimental and theoretical aspects of issues within the field of Chemistry, and to train students to be able to conduct independent scientific work. Based on the comprehensive scientific training they shall acquire in this study program, graduates will be able to address problems that arise within the most diverse fields of Chemistry, and related areas, in a successful and independent manner. Master's graduates will be able to work in a broad professional field that ranges from fundamental and industrial research, application-related development, and technical sales and distribution, to functions that involve planning, review and management in industry and administration. The Master's degree gives particularly talented graduates the opportunity to take up doctoral studies, particularly in the fields of Natural Sciences and Technology, thereby enabling them to access fields of work that have a strong focus on research and innovation as well as significant future potential.

Section 3 – Admission requirements

(1) The admission requirements shall be deemed as fulfilled if applicants possess a Bachelor of Science degree from a university within the scope of application of the Framework Act for Higher Education (*HRG*) that they have obtained as part of a Bachelor's Program in Chemistry with a standard period of study of at least six semesters and in which at least 180 credits have been earned.

(2) The admission requirements for the Master's Program shall also be deemed fulfilled if applicants have obtained a Bachelor of Science degree in an equivalent subject area at an institution of higher education within the scope of application of the Framework Act for Higher Education (*HRG*) or if applicants have obtained an equivalent Bachelor's degree in one of the Natural Sciences at an institution of higher education outside the scope of the Framework Act for Higher Education, provided that the standard period of study for the respective program is at least three years (180 credits). In this regard, the examination board responsible for the Master's Program in Chemistry shall assess the equivalence of the degree with the Bachelor of Science awarded for the Bachelor's Program in Chemistry at Technische Universität Berlin.

(3) Students are not required to prove knowledge of foreign languages for this study program. However, since English skills are generally necessary for studying the scientific literature, good knowledge of the English language is considered desirable. Some of the classes held as part of compulsory elective or elective modules may also be taught in English.

Section 4 – Program start

(1) As a rule, the Master's Program in Chemistry begins in the winter semester.

(2) The course schedule recommended for the Master's Program in Chemistry for students starting in the winter semester is depicted in Annex 1.

Section 5 – Credit points, required coursework, and standard period of study

(1) Coursework and examinations are assessed in credits in accordance with the European Credit Transfer and Accumulation System (ECTS). For students of average to good aptitude, one credit corresponds to a total time expenditure of about 25 to 30 hours.

(2) The standard period of study in the Master's Program is four semesters. The required coursework amounts to a total of 120 credits.

Section 6 – Course guidance

(1) In matters related to the Master's Program in Chemistry, an advisory service is always available for students seeking personal advice. Its task is to advise students on how to structure their studies in a meaningful way. In addition, it is responsible for holding an introductory event at the beginning of each academic year and for publishing a study guide.

(2) The advisory service shall be provided by professors with the support of student representatives (student assistants). For this purpose, the Institute Council of the Institute of Chemistry shall elect and appoint a representative from among the professors to act as advisor for a period of two years.

Section 7 – Mentoring Program and elective modules

(1) Each student shall be assigned a personal mentor. It is the mentor's task, in close consultation with the student, to select the compulsory elective modules and elective modules of the Master's Program reflecting the student's individual interests.

(2) Every student should have chosen their own mentor by the beginning of the second semester. The choice of mentor must be made known to the examination board of the Master's Program in Chemistry. A change of mentor as the course proceeds shall only be possible after consultation with the chair of the examination board.

(3) All full-time university professors, or qualified lecturers with a post-doctoral degree (*Habilitation*), of Technische Universität Berlin's Institute of Chemistry may act as mentors.

Section 8 – Modules and types of classes

(1) The program consists of the Master's thesis and modules, which may include the following types of classes: lectures, exercises, labs, seminars, integrated courses.

(2) Lectures serve the purpose of presenting scientific content and methodological knowledge in a systematic context.

(3) In exercises, which are usually offered in combination with lectures, students shall deal in depth with the lecture content by means of working independently on exemplary questions.

(4) In labs, students shall acquire the required methodological knowledge by performing experimental tasks and by dealing independently with experimental questions.

(5) In addition to the in-depth study of a scientific topic, seminars primarily serve to train students' presentation skills and enhance their ability to engage in critical discussions.

(6) Integrated courses are generally a flexible combination of a lecture and other types of classes.

(7) A module consists of one or several classes in an interrelated topic area.

(8) The module descriptions contain the admission requirements for the individual modules. Individual modules or module components may require the previous successful completion of other modules or module components.

Section 9 – Proof of academic performance and examinations taken

(1) Students who have successfully worked in an independent manner in classes may be given proof of this in the form of an ungraded certificate of completion. Further details are regulated by the module supervisors. Coursework may be repeated indefinitely.

(2) In order to complete a module, students are generally required to perform coursework and/or take a final examination. Further details are regulated by the Examination Regulations.

II. Course procedure

Section 10 – Program content and structure

(1) The Master's Program in Chemistry consists of the following modules:

- (a) **Coordination and Material Chemistry (8 credits)**
- (b) **Synthesis and Catalysis: Strategies, Concepts and Methods (6 credits)**
- (c) **Physical Chemistry – from Molecule to Material (12 credits)**
- (d) **Industrial Processes and Technical Catalysis (6 credits)**
- (e) **Computer Application in Chemistry (3 credits)**
- (f) **Lecture series (1 credit)**
- (g) **Anorganic Solid State and Functional Materials (4 credits)**
- (h) **Organic Chemistry IV (6 credits)**
- (i) **Scientific Presentation (1 credit)**
- (j) **Research Lab (13 credits)**
- (k) **Compulsory elective modules (15-21 credits):**

Within the scope of the compulsory elective part of the program, students are required to choose one of the following areas of specialization for in-depth studies (cf. Annex 3):

- **Biophysical and Biological Chemistry**
- **Chemical Engineering**
- **Chemistry for Materials Science**
- **Synthesis and Catalysis**
- **Theory**

Students must acquire at least 15 credits in one of these compulsory elective subjects in the modules offered in the respective areas of specialization as listed in the Annex. A total of up to 21 credits may be considered in the compulsory elective part of the program.

(1) **Electives (9-15 credits):**

In this part of the program, students may choose from the entire range of modules offered at Technische Universität Berlin, other universities and equivalent institutions of higher education within the scope of application of the Framework Act for Higher Education (*HRG*), or from the range of courses offered at foreign universities and institutions of higher education that have been accredited as equivalent.

The **compulsory electives and electives** must together amount to **30 credits**.

(2) Students shall select the compulsory elective and elective modules as well as the research internship in consultation with their personal mentor (see Section 7). The research internships offered are listed in the Annex and are subject to changes by the examination board.

(3) As a rule, the Master's Program in Chemistry is completed with the **Master's thesis (30 credits)**.

(4) The module descriptions, in each of their current versions, are published by the Faculty Board of Faculty II – Mathematics and Natural Sciences. The Faculty Board of Faculty II – Mathematics and Natural Sciences – may amend the module descriptions at the request of the examination board for the Master's Program in Chemistry.

Section 11 – Master's thesis

(1) The Master's thesis, amounting to a total of 30 credits, is to be prepared in the following two stages, which are to be carried out immediately one after the other:

a) Research stage (around 22 credits). During this stage, students shall be trained in how to conduct independent scientific work by dealing intensively with a research topic from the field of chemical science.

b) Presentation (about 8 credits). Students shall summarize the results from the research stage for the Master thesis in a written draft and give a presentation of their findings to their respective working group.

(2) The supervisor responsible for supervising the Master's thesis must be a full-time professor or a qualified lecturer with a post-doctoral degree (*Habilitation*) at Technische Universität Berlin's Institute of Chemistry.

(3) The Master's thesis shall be completed at the Institute of Chemistry of Technische Universität Berlin. In exceptional cases, and upon approval by the examination board for the Master's Program in Chemistry, a Master's thesis may also be completed in other departments of Technische Universität Berlin or externally, provided that the supervisor setting the topic of the thesis belongs to the category of persons mentioned in Subsection 2.

(4) The Master's thesis shall be completed within a maximum of six months working full time. Exceptions to this stipulation are regulated by the Examination Regulations and subject to the approval of the examination board.

III. Final provisions

Section 12 – Entry into force

These Study Regulations shall enter into force on the day after their publication in the Official Gazette of Technische Universität Berlin (*Amtliches Mitteilungsblatt*).

Annex 3: Summary of compulsory elective modules and their applicability to the respective areas of specialization (including corresponding credits):

Module	Biophysical and Biological Chemistry	Chemical Engineering	Chemistry for Material Science	Synthesis and Catalysis	Theory
Biological Chemistry II	4			3	
Biological Chemistry III	6			9	
Recent Topics of Biophysical Chemistry	3				
Recent Topics of Colloid und Interface Chemistry			3		3
Modern Biological Aspects of Physical Chemistry	6	6	6		
Biophysical Chemistry	8		8		
Electro Catalysis und Electrochemical Energy Transformation		3	3		3
Enzyme Technology I	6	6			
Enzyme Technology II	3	3			
Enzyme Technology III	3	3			
Polymer Interfaces		3	3		
Material Sciences Physical Chemistry			6		6
Mechanisms of Heterogeneous-Catalytic Reactions		3		3	
Multi Phase Reactions		3		3	
Concepts in Metal Organic Chemistry			3		
Dynamic Solid State Analytic in Heterogeneous Catalysis			3	3	
Model Compounds in Bio-Anorganic Chemistry	3			3	
Modern Aspects of Solid State Research			3	3	
Nanostructured Materials			3	3	
Natural Product and Agent Synthesis	3			3	
Physical Chemistry of Interfaces		3	3		3
Phase Transformations and their Influence on Material Characteristics			3	3	
Quantum Chemistry					6
Reaction Kinetics		12			
Stereoselective Synthesis Methods				3	
Theory of Soft Condensed Matter			6		6

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Examination Regulations for the Consecutive Master's Program in Chemistry at Faculty II – Mathematics and Natural Sciences – of Technische Universität Berlin

of 19 January 2011

On 19 January 2011, the Faculty Board of Faculty II – Mathematics and Natural Sciences – enacted the following Examination Regulations for the Master's Program in Chemistry, in accordance with Section 71 (1) no. 1 of the Berlin State Higher Education Act (*Berliner Hochschulgesetz – BerLHG*), in the version of 13 February 2003 (Berlin Gazette of Laws and Ordinances [*GVBl.*], page 82), last amended by the Amendment Act of 15 December 2010 (Berlin Gazette of Laws and Ordinances, page 560):

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Section 1 – Scope of application

These Examination Regulations, in conjunction with the Study Regulations for the Master's Program in Chemistry and the current version of the Regulations Governing General Examination Procedures in Undergraduate and Graduate Courses (*AllgPO*) apply to students enrolled in the Master's Program in Chemistry.

Section 2 – Purpose of the Master's examination

The examinations in the Master's Program in Chemistry serve the purpose of testing and assessing students' in-depth knowledge in the various fields of modern Chemistry, as well as their advanced knowledge in special fields, and their ability to perform scientific work in an independent manner.

Section 3 – Academic degree

On behalf of Faculty II – Mathematics and Natural Sciences, Technische Universität Berlin awards the academic degree Master of Science (M.Sc.) to students who have passed the Master's examination.

Section 4 – Duration of study

The standard period of study is four semesters.

Section 5 – Scope and type of the Master's examination

(1) The Master's examination consists of the Master's thesis (30 credits) and module examinations amounting to a total of 90 credits in compulsory, compulsory-elective, and elective modules according to the module list (see Annex).

(2) As a rule, a module is completed by means of the corresponding module examination (see Annex: Module list).

Section 6 – Master's thesis

(1) The Master's thesis is an assessed assignment and, likewise, an integral part of the Master's Program. Candidates are required to demonstrate their capability to work independently on a self-contained project from the Master's Program in Chemistry, applying scientific methods and complying with a specified deadline. Pursuant to Subsection 9, the Master's thesis may also be approved as a joint Master's thesis.

(2) In order to register the Master's thesis, students must submit proof of having passed the following modules:

- Coordination and Material Chemistry
- Synthesis and Catalysis: Strategies, Concepts and Methods
- Physical Chemistry – from Molecule to Material
- Industrial Processes and Technical Catalysis
- Computer Application in Chemistry
- Lecture series
- Anorganic Solid State and Functional Materials
- Organic Chemistry IV

(3) Following their admission to the Master's examination, students are entitled to apply to the relevant office of the Central University Administration for permission to begin work on a Master's thesis. In doing so, students may propose a supervisor and a topic; any examiner may act as supervisor. Upon consultation with the candidate, the supervisor shall forward the proposal for the topic to the relevant office of the university administration, which will then approve the topic and issue an official submission deadline.

(4) The Master's thesis shall be completed within a research group at Technische Universität Berlin's Institute of Chemistry. In exceptional cases, and upon approval by the examination board for the Master's Program in Chemistry, a Master's thesis may also be completed at other departments of Technische Universität Berlin or externally, provided that the supervisor setting the thesis topic belongs to the category of persons specified in Section 3 of the Regulations Governing General Examination Procedures in Undergraduate and Graduate courses (*AllgPO*). Students are required to work full time and independently on the Master's thesis under the supervision of the supervisor who has set the topic.

(5) The normal period for completion is six months. Students should use approximately the first four months of this period to familiarize themselves with the topic and to acquire the necessary specialist knowledge and skills. The remaining two months should be designated for preparing the written summary of the scientific results and for presenting the latter within the supervising research group. The written draft should not exceed 40 pages in length. Annexes, tables, measuring curves, process specifications, etc., are not to be considered in this regard. Students must briefly present the results to a colloquium of the supervising research group.

(6) The examination board shall ensure the equivalence of topics and make certain that the Master's thesis can be prepared within the preparation period. The examination board shall decide on

exceptions in special cases of hardship.

(7) At the candidate's request, and upon consultation with the supervisor, the examination board may in exceptional cases extend the preparation period by no more than a further two months. The topic of the Master's thesis may be rejected on no more than one occasion, and only within the first six weeks of the preparation period.

(8) When submitting their independently prepared Master's theses, students must declare in writing that the thesis was prepared without unauthorized outside help and that no sources and aids other than those stated were used. Material taken from other scientific papers must be identified as such at the relevant places within the Master's thesis. In the event that, with the consent of the supervisor and the examination board, the Master's thesis has been completed in a language other than German, it must contain an annex with a short summary in German. Two copies of the completed thesis must be submitted within the prescribed time limit to the relevant office of the Central University Administration. The date of submission shall be recorded there. The work will then be forwarded for review and assessment.

(9) Two assessors, including the supervisor, must assess the Master's thesis in accordance with Section 11 of the Regulations Governing General Examination Procedures in Undergraduate and Graduate Courses (*AllgPO*). The assessment reports shall be sent to the relevant office of the university administration within four weeks of the submission of the thesis. In the event that the assessments differ, but both assessors have graded the thesis as "adequate" or better, the grade shall be averaged in accordance with Section 11 (2) of the *AllgPO*. In the event of differing assessments, with one assessor having graded the thesis as "inadequate", a third assessor must be appointed. In the event that the third assessor grades the Master's thesis as "adequate" or better, the final assessment of the Master's thesis shall be determined by the arithmetic mean of the two assessments grading the thesis as "adequate" or better. Failing that, the Master's thesis shall be deemed to have been "failed".

(10) The Master's thesis may be jointly completed by several students in the form of a group thesis with a joint topic (joint Master's thesis) as long as each of the contributions that are to be assessed as part of the examination can be clearly identified as belonging to an individual student on the basis of objective criteria, such as sections or page numbers, and meets the requirements of Subsection 1, Sentence 2. The students concerned must apply together for the joint Master's thesis. The examination board shall decide on the application based on the opinion of the designated supervisor. The declaration in accordance with Subsection 7, Sentence 1, must be individually submitted by the respective candidates for those parts of the thesis that are marked as their contributions.

(11) Master's theses that are not submitted by the deadline, or that have been assessed as "inadequate", may only be repeated once. The topic may only be rejected within the period specified in Subsection 6 if the candidate did not make use of this option for the first Master's thesis.

(12) The assessed Master's thesis shall remain with the Institute or supervisor. It may be made available temporarily to the author for inspection and for making copies. It shall be retained for at least three years.

Section 7 – Entry into force

These Examination Regulations shall enter into force on the day after their publication in the Official Gazette of Technische Universität Berlin (*Amtliches Mitteilungsblatt*).

Annex: Module list

Module	Credits	Type of examination
Coordination and Material Chemistry	8	written
Synthesis and Catalysis: Strategies, Concepts and Methods	6	oral
Physical Chemistry – from Molecule to Material	12	oral
Industrial Processes and Technical Catalysis	6	written
Computer Application in Chemistry	3	without examination*
Lecture Series	1	without examination*
Anorganic Solid State and Functional Materials	4	written
Organic Chemistry IV	6	written
Scientific Presentation	1	without examination*
Research Lab (CE)	13	according to the requirements of the module supervisor
Compulsory electives (CE)	15-21	according to the requirements of the module supervisor
Electives	9-15	according to the requirements of the module supervisor
Master's thesis	30	
In total:	120	

* These modules are not included in the overall grade of the Master's Program.
