

## **Examination Regulations**

for the faculty 09  
of the Johannes Gutenberg University Mainz  
for the examination  
in the master's Programme in Chemistry  
of 27 August 2015

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Based on Section 7, Paragraph 2, No. 2 and Section 86, Paragraph 2, Sentence 1, No. 3 of the Higher Education Act in the version of 19 November 2010 (GVBl. p. 463), last amended by the Act of 24 July 2014 (GVBl. p. 125), BS 223-41, the Faculty Council of Department 09 of the Johannes Gutenberg University Mainz adopted the following regulations for the examination in the master's degree programme in Chemistry on 19 September 2012, on 24 April 2013 and on 18 June 2014. These regulations were approved by the President in a letter dated 25 August 2015, ref. no.: 03/02/09/01/00-059. They are hereby made public.

**Table of Contents**

§ 1 Scope of Application, Aim of the Programme, Purpose of the Master's Examination, Academic Degree .....	3
§ 2 Requirements for Admission.....	3
§ 3 Extent and form of the master's examination .....	4
§ 4 Regular duration of study, study guidance, deadlines .....	4
§ 5 Modularised study structure, credit point system, active participation, course achievements, course participation .....	5
§ 6 Extent of study, modules .....	7
§ 7 Examination Board .....	8
§ 8 Examiners and observers .....	9
§ 9 Recognition of study and examination achievements and crediting of qualifications acquired outside the university .....	9
§ 10 Registration and admission to the Master's examination.....	10
§ 11 Module examinations.....	10
§ 12 Oral module examinations.....	11
§ 13 Written module examinations, portfolio examinations .....	12
§ 14 Practical module examinations.....	14
§ 15 Master thesis .....	15
§ 16 Assessment of examination and study performance, Determination of the overall grade .....	16
§ 17 Passing and failing, repeating examinations .....	17
§ 18 Absence, withdrawal, deception, violation of regulations .....	18
§ 19 Report, certificate, diploma supplement .....	19
§ 20 Invalidity of the Master's examination.....	20
§ 21 Objection.....	21
§ 22 Right to information of the candidate .....	21
§ 23 Examination administration system .....	21
§ 24 Coming into effect of the regulations .....	21
Appendix to §§ 5, 6, 11-14, 16 and 17: Structure of the study programme, modules .....	23

## § 1

### **Scope of Application, Aim of the Programme, Purpose of the Master's Examination, Academic Degree**

(1) These regulations govern the examination in the Master's degree programme in Chemistry of the Faculty 09 at the Johannes Gutenberg University Mainz.

(2) The Master's degree programme is a scientific degree programme which, building on a first professionally qualifying university degree, leads to a further professionally qualifying academic degree. Its aim is to impart in-depth scientific expertise in the subject areas of chemistry.

(3) The Master's examination shall determine whether the candidate has acquired the specialised knowledge in the field of chemistry necessary for the transition to professional practice, has an overview of the interrelationships of the subject area and has the ability to apply scientific methods and knowledge.

(4) After successful completion of the programme and the examination, the responsible faculty shall award the academic degree of "Master of Science (M. Sc.)". This academic degree may be added to the name of the graduate.

## § 2

### **Requirements for Admission**

(1) Admission requirements for the Master's degree programme in chemistry are:

Proof of a Bachelor's degree in chemistry from a higher education institution in Germany or a degree from a higher education institution in Germany or abroad which does not differ significantly from this. Achievements that were not completed in the underlying Bachelor's degree programme can also be taken into account. The examination board decides on this.

(2) Proof of required language skills in English at least on level B2 of the Common European Framework of Reference for Languages. Certificates that are recognised are specified in § 7 Para. 5 of the enrolment regulations of the Johannes Gutenberg University Mainz. These certificates are also deemed to be provided by the submission of a German Abitur certificate showing that at least five years (four years in the case of G8) of English were attended in school lessons and completed with at least "sufficient" or 5 points.

(3) A further prerequisite for admission to the Master's degree programme in Chemistry is that the examination entitlement for this degree programme has not yet been lost. A corresponding declaration must be submitted for verification in this regard.

(4) As far as a degree certificate is not available by the end of the application period as proof of a Bachelor's degree in accordance with Paragraph 1, an application is possible on the basis of a certificate of examination and study achievements already completed to the extent of at least 135 credit points, which must have been issued by the appropriate office of the previous university, or on the basis of a provisional certificate of recognition from the Johannes Gutenberg University Mainz for foreign degrees. The total sum of the credit points must be declared.

If there is an admission restriction for the degree programme, the regulations of the University Selection Statutes in the currently valid version must be observed; in this case, the final result of the Bachelor's degree is not taken into account in the selection procedure.

If an applicant is selected on the basis of the certificate named in clause 1, admission is subject to the condition that proof of the successful previous Bachelor's degree, which proves the

general and subject-specific admission requirements, is submitted within a period specified in the admission notice. If this proof is not provided within the deadline, the admission will expire.

(5) For applicants who have neither acquired their higher education entrance qualification at a German-speaking institution nor a degree in a German-speaking degree programme, German language skills at the level (DSH-2) of the "Deutsche Sprachprüfung für den Hochschulzugang ausländischer Studienbewerber (DSH)" are recommended. Modules in which teaching and examinations are exclusively in German may not be selected.

(6) Even with existing admission requirements, admission to the master's degree programme in Chemistry depends on successful completion of the admission procedure. If there is an admission restriction for the master's degree programme, admission is granted in accordance with the university selection statutes.

(7) Students can start their studies in the winter and summer term.

### § 3

#### Extent and form of the master's examination

(1) The Master's examination consists of the following examinations:

1. The module examinations during the course of study,
2. The written master's thesis

(2) Students with disabilities or chronic illnesses shall be granted compensation for disadvantages to preserve their equal opportunities. If a candidate credibly demonstrates that he or she is unable to take the examinations in whole or in part in the intended form due to a prolonged or permanent disability or chronic illness, the chairperson of the examination board must allow the examination to be taken within an extended processing time or equivalent examinations to be taken in another form. For this purpose, the submission of a medical or official medical certificate may be required. The same applies to coursework.

(3) Only students who are duly enrolled in the master's degree programme in Chemistry at the Johannes Gutenberg University Mainz, who are not on leave of absence and who have not lost their right to take examinations may complete coursework and examinations. § Section 2, paragraph 7 of the Regulations for the Admission and Enrolment of Applicants at the Johannes Gutenberg University Mainz remains unaffected.

### § 4

#### Regular duration of study, study guidance, deadlines

(1) The standard period of study including the time for writing the Master's thesis is two years (4 semesters). Within the scope of the Master's degree programme, a total of at least 120 credit points (according to § 6 Para. 2) must be achieved.

(2) In the interest of keeping to the standard period of study, the study programme is tightly organised. If there are indications that a student's academic success is at risk, the student may be invited in writing or electronically to attend a study counselling session; attendance cannot be made compulsory. During the study counselling, the previous study experiences are discussed and the reasons for falling short of the performance expectations are explained; furthermore, it is discussed how a successful course of studies can be achieved. Every student has a legal right to this counselling.

(3) In determining the periods of study relevant for compliance with time limits prescribed under these examination regulations, extensions and interruptions of periods of study shall not be taken into account insofar as they are due to

1. participation in committees of an institution of higher education, a student body or a student union provided for by law or by statute
2. illness, a disability or chronic illness or other reasons for which the student is not responsible,
3. pregnancy or bringing up a child; in these cases, at least the statutory maternity protection periods and the periods of parental leave in accordance with the Federal Parental Allowance and Parental Leave Act shall be made possible,
4. the care of a relative in need of care,
5. proper relevant study abroad for up to two semesters; this does not apply to periods of study abroad which are to be completed according to the examination regulations or were required to be completed.

The obligation to provide the evidence according to sentence 1 is incumbent on the student.

As a rule, the processing period of a domestic examination paper cannot be interrupted by the statutory periods of maternity protection and/or parental leave. As a rule, the submitted work shall be deemed not to have been assigned. After expiry of the protection periods, the candidate shall receive a new topic upon application.

## § 5

### **Modularised study structure, credit point system, active participation, course achievements, course participation**

(1) The courses and internships of the Master's degree programme are offered within the framework of modules. "Module" means thematically and temporally coordinated teaching units. As a rule, each module is concluded with a module examination according to § 11. In particularly justified individual cases, a module examination may consist of partial examinations. In particularly justified cases, several modules may also be completed with one examination. For the examinations according to sentences 3 and 4, § 11 shall apply accordingly.

(2) Each module is assigned credit points (= LP) corresponding to the approximate amount of time usually required by the student for attending all compulsory courses of the module, the preparation and follow-up of the course material, the acquisition of credits, if required, the preparation for the examination and the taking of the module examination. The same applies to the Master's thesis. Credit points are awarded after successful completion of the module according to Paragraph 1, including all course work to be completed within the framework of the module according to Paragraph 4, or after successful completion of the Master's thesis. The standards for the allocation of credit points correspond to the European Credit Transfer and Accumulation System (ECTS). One credit point corresponds to an average time expenditure of 30 working hours.

(3) The prerequisite for the award of credit points for modules is, in principle, the successful completion of the module examination according to § 11 after active participation in the courses of the module. For lectures, no proof of active participation is required, exceptions are regulated in the appendix. The conditions for active participation are announced at the latest at the beginning of the course; active participation can consist, for example, of reading or working through given reading material, giving lectures (25 min.), participating in exercises and seminars, working on seminar and practical assignments, passing entrance colloquia and

examinations, preparing measurement protocols, handing in preparations and protocols on time, working on exercise assignments, etc. The type and extent of active participation is determined by the subject matter. The type and extent of active participation shall be limited appropriately.

(4) The proper completion of a module can, as far as this is regulated in the respective appendix, be made dependent on the achievement of study achievements and active participation beyond the passing of the module examination. Course achievements primarily serve to monitor individual performance; their grading is not included in the module grade. A course achievement is deemed to have been completed if the performance review is graded at least as "passed" or "sufficient" (4.0) in accordance with § 16 Para. 1. Such performance assessments can comprise several parts and consist primarily of written examinations, take-home examinations, oral examinations, protocols, portfolios, colloquia, presentations, practical exercises and assignments. Further details are regulated in the appendix. If the appendix provides for several alternative forms of performance assessment, the course leader shall announce the respective type and duration of the performance assessment at the latest at the beginning of the lecture period. Graded coursework is assessed in accordance with § 16.

(5) Students may only be required to attend courses as a prerequisite for examinations pursuant to section 26, paragraph 3, no. 7 HochSchG if this is necessary to achieve the learning objective of the course. This is the case with practical exercises, internships and excursions. Other courses in which attendance may be required are:

- a) courses in which safety-relevant actions are taught
- b) subject didactic courses in which practical professional action is practised by simulating teaching/learning situations
- c) Courses in which the main learning objective(s) is (are) the moderation of academic discussions and/or the presentation of a topic to an expert audience as well as the practice of appropriate and appreciative feedback
- d) Courses in which students use licensed programmes on computers within the working group to work on internship-related tasks.

Courses in which regular attendance is compulsory are marked in the appendix. Attendance at a course must still be confirmed if the student has missed up to two individual courses, but no more than four course hours in the semester or, in the case of practical courses, has missed them with an excuse; exceptions may be permitted in justified individual cases. Documented participation in a safety briefing is a prerequisite for participation in practical courses.

(6) As a rule, timely and binding registration is required for participation in courses. The chairperson of the examination board shall set the respective registration dates and modalities in consultation with the course instructor. If the number of registrations for a course with limited numbers of participants exceeds the number of available places, the Senate's guidelines on access to courses with limited numbers of participants, as amended from time to time, shall be used for allocation.

(7) The repetition of a course in which an academic performance has already been achieved with the aim of acquiring further credit points or improving the grade achieved is not permitted.

(8) Failed coursework should be repeated at the next possible date. The repetition of practical courses is only possible twice. The repetition of a study performance with the aim of acquiring further credit points or improving the grade achieved is not permitted.

(9) Credit points for individual courses are only awarded upon written application and only for transfer purposes. If, in justified individual cases, individual certificates are required for a course achievement, a certificate of study shall be issued. The certificate of study shall contain at least the name of the participating student, the exact designation of the course and the module, the semester in which the course was held, the number of credit points and, in the case of a course achievement, also the type and result of the performance review.

## § 6

### Extent of study, modules

(1) The total amount of time in semester hours per week (= SWS) of the courses required for the successful completion of the degree programme is:

40 SWS in the two selectable specialisations and 20 - 60 SWS in the compulsory elective modules. Further details are regulated in the appendix.

(2) Within the scope of the degree programme, two specialisations must be selected, each consisting of four modules. Details are regulated in the appendix.

(3) The registration for the modules is accompanied by the submission of a declaration in which the chosen specialisations are bindingly specified. If this declaration is missing, no coursework and examinations may be taken in the respective focus.

(4) A change of a specialisation can be applied for once during the entire study programme, provided that more than two modules of the specialisation have not already been completed. Successfully completed modules of the old specialisation will then be counted as compulsory elective modules, provided that the number of compulsory elective modules already selected allows this. The change of a specialisation must be applied for in writing to the chairperson of the examination board. §17 Para. 4 remains unaffected by this.

(5) For successful completion of the degree programme, a total of at least 120 credit points (LP) must be attained, of which:

1. 48 LP are distributed to the two selectable specialisations,
2. 42 LP are distributed to the compulsory elective modules,
3. 30 LP are distributed to the Master's thesis.

(6) The compulsory and elective courses belonging to the respective modules are listed in the appendix. The department as well as the cooperating institutions shall ensure the required range of courses for each module.

(7) Courses or modules that have already been completed in the same or essentially identical form in the Bachelor's degree programme on which the Master's degree programme is based cannot be taken in the Master's degree programme. A renewed crediting of the course and examination achievements is excluded. Instead, another suitable course or module must be completed. If a compulsory course or a compulsory module is to be replaced, the examination board shall determine the equivalent course or the equivalent module to be completed. Excepted from sentence 2 are achievements that were completed in addition to the coursework and examinations required for the Bachelor's degree.

## § 7

### Examination Board

(1) The departmental council shall elect an examination board for the organisation of examinations and the tasks defined by these regulations. Reference is made to Article 37, Paragraph 3 HochSchG.

(2) The examination board shall consist of four members from the group of university teachers and one member each from the group of students, the group of academic staff and the group of technical and administrative staff. The chairperson and his/her deputy must be university teachers. The examination board shall decide by a simple majority of the votes of the members present; in the event of a tie, the chairperson shall have the casting vote. Section 24, paragraph 2 HochSchG shall apply to votes on examination performance. The term of office of the student member is one year, that of the other members three years. The re-election of a member is possible. If a member leaves prematurely, a successor shall be elected for the remaining term of office.

(3) Unless otherwise specified, the examination board shall be responsible for all decisions to be taken under these regulations; it may delegate the execution of tasks to the chairperson. The examination board is supported in its administrative activities by the responsible examination office or study office. The examination board shall ensure that the provisions of these regulations are observed. It shall regularly report to the faculty on the development of the study and examination times, including the actual processing times for the Master's thesis, as well as on the distribution of the module grades and the overall grades; the report shall be disclosed in a suitable manner by the university. In addition, the examination board shall make suggestions to the competent committee for studies and teaching and to the department for reform of the curriculum and the examination regulations.

(4) The examination board, in cooperation with the department or subject, shall ensure that the study and examination achievements can be completed within the time periods specified in these regulations. To this end, the candidate shall be informed in good time both of the type and number of study and examination achievements to be taken within the framework of a module and of the dates by which they are to be taken. The candidates shall also be informed in good time of the respective repetition dates for each course and examination achievement.

(5) The members of the examination board shall have the right to attend all performance reviews, module examinations and the oral final examination. This right does not extend to the deliberation and the announcement of the grade.

(6) The meetings of the Audit Committee shall not be public. The members of the examination board shall be subject to official secrecy. If they are not in public service, they shall be sworn to secrecy by the chairperson.

(7) Incriminating decisions of the examination board shall be communicated to the student concerned in writing or electronically without delay. If the notification concerns the final failure of an examination or the loss of the examination entitlement in the Master's degree programme for other reasons, the notification may not be made exclusively electronically. The notification shall be accompanied by instructions on how to appeal. Reference is made to § 23.

(8) The examination board shall be entitled to check academic work for cheating and attempted cheating also by electronic means. For this purpose, it may request the author to submit a suitable electronic version of the work within a reasonable period of time. If this request is not complied with, the work may be assessed as failed.



## § 8

### Examiners and observers

(1) The Master's examination including the module examinations shall be conducted by examiners. The examination board appoints the examiners. It may delegate the appointment to the chairperson.

(2) Examiners shall be university professors, habilitated professors, junior research group leaders who are funded by a university-wide funding programme which provides for a review procedure, academic staff with duties pursuant to section 57, paragraph 1, sentence 2 HochSchG, lecturers pursuant to section 63 HochSchG and lecturers for special duties pursuant to section 58 HochSchG. Retired professors, honorary professors and persons experienced in professional practice pursuant to § 25, section 4, sentence 2 HochSchG may be appointed as examiners by resolution of the examination board. Only persons who teach at a higher education institution in the subject in which the examination is being taken or who have done so in the past four semesters or who have proven relevant practical professional experience may be appointed as examiners for a subject examination.

(3) In modules in which the examination performance is assigned to a course of the module, as a rule the lecturers of this course shall conduct the examination without special appointment by the examination board. If the examination performance is not assigned to a specific course, the chairperson of the examination committee shall ensure that the candidates are informed of the names of the examiners in good time, as a rule at least four weeks before the examination date. The candidate may propose an examiner. The suggestion does not constitute a claim. Should a lecturer be unable to conduct examinations for compelling reasons, the examination board may appoint another examiner.

(4) The subject examiners appoint the assessors. The assessor must have at least the qualification to be determined by the examination or an equivalent qualification. They shall take the transcript of oral and practical examinations and may be entrusted with the preliminary correction of written examination performances. They shall be entitled to exclude candidates from continuing the examination in the event of disruptions during an examination.

(5) Section 7, paragraph 6, sentences 2 and 3 shall apply accordingly to examiners and assessors.

## § 9

### Recognition of study and examination achievements and crediting of qualifications acquired outside the university

(1) The provisions of the Partial Framework Examination Regulations of the Johannes Gutenberg University Mainz for the Recognition of Study and Examination Achievements and Degrees and for the Recognition of Qualifications Acquired Outside the University (Recognition Statutes) in the currently valid version shall apply to the recognition of study and examination achievements and the recognition of qualifications acquired outside the university.

(2) In deviation from § 2 Para. 7 Sentence 10 of the Recognition Statutes, recognition without transfer of grades may also be applied for regarding individual study and examination achievements completed during the period abroad.

## § 10

### Registration and admission to the Master's examination

(1) The application for admission to the Master's examination is deemed to have been submitted when registering for the first module examination or the first partial module examination within the period announced by the examination board.

(2) If not already submitted with the application for admission to studies, the application for admission to the Master's examination shall be accompanied by:

1. a declaration as to whether the candidate has already definitively failed a Master's examination in the Master's degree programme in Chemistry at a higher education institution in Germany or whether he or she is in an examination procedure at a higher education institution in Germany or abroad which has not been completed,

2. a declaration as to whether and, if so, how often the candidate has already failed examinations and examination-relevant coursework in the Master's degree programme in Chemistry or in the same subjects or modules of another degree programme at a higher education institution in Germany or abroad.

In the case of simultaneous studies in another degree programme, the candidate must affirm that he or she will immediately notify the examination board in writing of the start and completion of the examination procedure as well as the failure of examinations and performance reviews in the other degree programme. The examination board is entitled to request a certificate from the transferring higher education institution stating that, according to local law, the entitlement to study and take examinations in the same or a comparable degree programme has not been definitively lost ("clearance certificate").

(3) Admission to the Master's examination shall be refused if

1. the application for admission has not been submitted in due time,

2. the documents according to paragraph 2 are incomplete,

3. the candidate is not enrolled in the Master's degree programme in Chemistry at the Johannes Gutenberg University Mainz,

4. the candidate has definitively failed a Master's examination in the same degree programme at a university in Germany, or

5. the candidate, due to the consideration of failed attempts in accordance with § 17, Para. 4, no longer has the opportunity to complete the examination performances required for passing the Master's examination.

If admission to the examination is refused on the basis of No. 4 or 5, the enrolment shall be cancelled.

(4) If the candidate is not admitted to the Master's examination, he or she shall be notified of this decision in writing or electronically, stating the reasons. The decision shall be accompanied by instructions on how to appeal.

## § 11

### Module examinations

(1) The module examinations are taken during the course of study; they usually conclude the respective module. Through the module examination, the candidate shall prove that he or she

has mastered the contents and methods of the module in the essential contexts and can apply the acquired knowledge and skills. The subject of the module examinations are basically the contents of the courses of the respective module. An exemplary selection of examination areas is permissible.

(2) A module examination shall in principle consist of an examination performance. An admission subject to reservation pursuant to Paragraph 5 shall remain unaffected. The appendix may provide for partial module examinations; these are only permissible in justified individual cases. The regulations pursuant to Paragraphs 3 to 5 and §§ 12 to 14 shall apply accordingly to partial module examinations. The assessment of the examination performances and the formation of the module grade of the modules prescribed according to the appendix (with the exception of the two research modules and the three selected compulsory elective modules) shall be carried out according to § 16. Modules which are concluded with an ungraded performance examination are marked in the appendix.

(3) The module examinations shall take place in oral, written or practical form in accordance with §§ 12 to 14. Other types of examinations than those specified in §§ 12 to 14 are permissible in accordance with the appendix; the provisions of §§ 12 to 14 shall be applied accordingly. The type and duration of the module examinations of the individual modules are regulated in the appendix. If the appendix provides for several alternative forms of performance assessment, the person responsible for the module shall announce the respective type and duration of the examinations at the latest at the beginning of the lecture period.

(4) Participation in module examinations requires timely and binding registration with the chairperson of the examination board. As a rule, registration for module examinations should take place in the semester in which the last course work of the respective module is completed. § 10 Para. 3 shall apply accordingly. The chairperson of the examination board shall set the respective examination and registration dates in consultation with the examiners in accordance with § 8. The examination and registration dates are announced at the beginning of the semester. After expiry of the registration deadline, withdrawal is only possible in justified individual cases; in particular in the case of proven illness, proven change of subject, proven exmatriculation or proven change of university.

(5) As a rule, a module examination can only be taken when the course work assigned to the module according to the appendix (§ 5 Para. 4) has been completed. If admission to a module examination depends on the submission of course work and this has not yet been completed, admission to a module examination is possible with reservations. The module examination is only passed when all coursework and the module examination have been successfully completed. The examination board shall decide on exceptions.

(6) If several modules are completed together with an examination, paragraphs 1 to 5 apply accordingly.

## § 12

### Oral module examinations

(1) Oral examinations shall be taken before at least two examiners (collegial examination) or before one examiner in the presence of an expert assessor pursuant to § 8, Para. 4. Presentations and oral examinations similar to presentations shall as a rule only be taken before one examiner; §13, Para. 4, Sentence 2 shall be observed.

(2) The oral examination may be conducted as an individual or group examination (max. four candidates) and shall last a minimum of 25 minutes and a maximum of 35 minutes per

candidate in accordance with the more detailed regulations in the appendix. In justified cases, different times may be specified in the appendix. If the examination questions make it necessary to include graphical or mathematical representations, these shall be part of the oral examination. Before determining the grade, the examiner shall hear the other examiners and assessors participating in a collegial examination. In the case of a peer examination, the examiners are required to agree on a joint grade. If no agreement can be reached, the arithmetic mean of the individual examiners' marks shall be calculated. § Section 16, Paragraph 3 shall be applied. The result shall be announced to the candidate after each oral examination. In the case of a fail, the candidate shall be informed of the reasons.

(3) A transcript shall be taken of the course of each oral examination. The transcript shall include the names of the examiners, the assessors, the person taking the transcript and the candidate, the beginning and end of the oral examination, the main subjects of the oral examination, the examination performances and the marks awarded. It shall be forwarded to the responsible examination office immediately after completion of the examination.

(4) In oral examinations, students of the department concerned may, on application, be present as listeners, provided none of the candidates objects to this when registering for the examination. The examiners shall decide on such applications, which must be submitted to the examination board three weeks before the oral examination, according to the number of places available. Candidates of the same examination in the same examination period are excluded as listeners. If the proper conduct of the examination is jeopardised, students may also be excluded during the examination. The publicity of the examination does not extend to the deliberation and announcement of the examination result.

(5) At the request of the candidate, the Equal Opportunities Officer of the Johannes Gutenberg University Mainz or the Equal Opportunities Officer of the department and, at the request of students with disabilities or chronic illnesses, the Representative for the Interests of Students with Disabilities or Chronic Illnesses may take part in oral examinations.

(6) At the request of the candidate and with the consent of the examiner(s), individual oral examinations may be held in a foreign language in accordance with more detailed regulations in the appendix.

### § 13

#### **Written module examinations, portfolio examinations**

(1) A written examination in the form of a written test is understood to mean the written processing of one or more tasks set by the examiner, which must be carried out using the usual methods of the subject, in a limited time, with as a rule limited aids and under supervision. The processing time shall be a minimum of 1 hour and a maximum of 2 hours, as specified in more detail in the appendix. In justified cases, other times may be specified in the appendix. Written examinations may be conducted in multimedia-supported form, provided that the requirements for this pursuant to paragraph 6 are met.

(2) A written examination in the form of a home assignment is to be understood as the written processing of a topic set by the examiner using the customary methods of the subject in a limited time. The topic should be chosen in such a way that the total time required to work on the topic corresponds to a student workload (within the meaning of § 5 Para. 2 Sentence 1) of a total of four weeks (full-time); justified exceptions to this can be regulated in the appendix. The examination board may set deadlines for the submission of the term paper. The term paper may also be written as a group examination with the written consent of the examiner.

(3) A written examination in the form of a portfolio is understood to be the independent writing, selection and compilation of a limited number of written documents on topics of a module and products produced in the corresponding courses. A portfolio consists of an introduction, a collection of documents and a reflection. The submission of the portfolio in digital form (presentation) is permitted with the consent of the examiner. The portfolio may also be prepared as a group examination with the written consent of the examiner.

(4) As a rule, written examination performances shall be assessed by one examiner. In the case of the last repeat examination, they shall be assessed by a second examiner. In the case of an assessment by two examiners, the grade shall be calculated from the arithmetic mean of both assessments. § Section 16, Paragraph 3 shall apply accordingly. The assessment procedure shall not exceed four weeks. If the repeat examination takes place in the same examination period, the examination results shall be announced at the latest two weeks, otherwise four weeks, before the date of the repeat examination.

(5) If the second repetition of a written examination is also failed, a supplementary oral examination shall take place if this is provided for in the appendix for the respective module or the respective subject. This supplementary oral examination shall always be held as an individual examination and shall last between 15 and 45 minutes; it shall be held promptly. In the oral supplementary examination, only a decision is made as to whether the candidate receives a grade of 4.0 or worse. A supplementary oral examination is excluded if the candidate did not take part in the examination or if the grade of "not sufficient" is based on § 18, Para. 3.

(6) Multimedia-supported examinations ("e-examinations") are permissible if they are suitable for providing or contributing to the evidence pursuant to § 11 Para. 1 Sentence 2; if necessary, they may be supplemented by other forms of examination. As a rule, multimedia-based examination tasks are prepared by two examiners. They consist in particular of free-text tasks, cloze texts and assignment tasks. Multiple choice questions are permissible under the conditions according to Paragraph 7. Before carrying out examinations supported by multimedia, it must be ensured that the electronic data can be clearly identified and unmistakably and permanently assigned to the candidates. The examination shall be conducted in the presence of a competent person (proctor). A transcript must be taken of the examination, including at least the names of the transcriber and the candidates, the beginning and end of the examination and any special incidents. In accordance with the provisions of § 22, the candidates shall be given the opportunity to inspect the multimedia-based examination and the result obtained. The terms of reference including a sample solution, the marking scheme, the individual examination results as well as the transcript shall be archived in accordance with the legal provisions.

(7) An examination in the answer-choice procedure ("multiple-choice examination") exists if the passing mark can be achieved exclusively by marking the correct or the incorrect answers. In this case, the pass mark is set by the examiner at between 50 and 60 percent, depending on the degree of difficulty of the examination. Examinations in the answer-choice procedure are only permissible if they are suitable for providing evidence of the achievement of the examination objective according to § 11, Para. 1, Sentence 2. An examination in the answer-choice procedure shall be prepared by two examiners. The examiners select the examination material, formulate the questions, determine the answer options and the weighting of the questions. In doing so, it must be ensured that the ratio of the points to be achieved in the individual questions to the achievable total number of points corresponds to the respective degree of difficulty. The examiners devise the marking scheme and apply it after the examination. The examination questions must be unambiguously understandable, clearly

answerable and suitable for clearly establishing the level of knowledge and understanding of the candidates to be examined. The requirements for passing the examination must be determined in advance. Before an examination in the answer-choice procedure is conducted for the first time, the examiners must submit a description of the examination to the responsible examination board, from which the suitability according to sentence 3 results. Furthermore, for each examination

- the selected questions,
- the sample solution and
- the marking scheme

must be deposited with the responsible examination board. The examination is passed if the candidate achieves at least the minimum percentage of the total achievable points required to pass the examination. This minimum percentage is constantly equal to the pass mark if the average examination performance of all examination candidates (in percent) does not fall below the value of the pass mark. If, however, the average examination performance falls below this value, the required minimum percentage is determined as the sum of the examination-specific bonus and the average percentage examination performance of all examination candidates multiplied by the examination-specific factor.

The examination-specific bonus is the statistically expected examination result (in percent) if the multiple-choice questions of the examination are completed purely at random by the candidate with an optimal strategy. The exam-specific factor is equal to the difference of one and the ratio of the exam-specific bonus to the pass mark. If the minimum number of points required to pass the examination has been achieved, the mark is

"very good" if at least 75 per cent,

"good" if at least 50 but less than 75 per cent,

"satisfactory" if at least 25 but less than 50 per cent,

"sufficient" if none or less than 25 percent

of the points exceeding the pass mark have been achieved. It is recommended to conduct examinations in the answer-choice procedure only if the number of examination candidates and the number of examination questions does not fall below 30, and to design them in such a way that the exam-specific bonus does not exceed the value of 20 per cent. This also applies to repeat examinations. After a failed second repetition of an examination in the answer-choice procedure, a supplementary oral examination shall take place in accordance with the provisions of paragraph 5; in deviation from paragraph 5, sentence 1, however, this shall be made compulsory. Paragraph 5 sentence 4 shall apply accordingly.

(8) The examiner shall decide on the aids that may be used in a written examination. The permitted aids are to be announced in good time before registration for the examination.

## § 14

### Practical module examinations

(1) The practical examination shall take place as an individual or group examination. If it is conducted as a group examination, § 15 Para. 8 shall apply accordingly. The type and duration of the practical examination is regulated in the appendix.

(2) The practical examination shall be taken before at least two examiners (collegial examination) or before one examiner in the presence of an expert assessor in accordance with § 8 Para. 4. In the case of a collegial examination, the examiners are required to agree on a joint mark. If no agreement can be reached, the arithmetic mean of the individual examiners' marks shall be calculated. § Section 16, Paragraph 3 shall apply. § 12 Para. 3 to 5 shall apply accordingly. The candidate shall be informed of the result of the practical examination following the practical examination.

(3) If the practical examination contains tasks to be prepared, these are to be worked out independently by the candidate. The examiner shall submit the examination tasks to be prepared in writing and in full to the chairing member of the examination committee. They are issued by the chairperson of the examination board. The dates of issue are to be recorded.

### **§ 15 Master thesis**

(1) The Master's thesis is a written examination which is intended to show that the candidate is able to work on a problem from the subject area of the Master's degree programme using the required methods within the specified period of time. The supervisor of the thesis has the duty to guide the candidate in the preparation of the Master's thesis and to inform him/herself regularly about the progress of the thesis.

(2) The supervision of the Master's thesis shall be assumed by a person from the group of persons authorised to conduct examinations pursuant to § 8, Para. 2. If the Master's thesis is to be written in an institution that is not part of the relevant department, the consent of the chairperson of the examination committee is required.

(3) The provisional topic of the Master's thesis shall be agreed with the supervisor and this shall be submitted to the examination board with a confirmation of the supervisor when registering for the Master's thesis in accordance with Paragraph 4. If the candidate does not find a supervisor, the chairperson of the examination committee shall ensure that the candidate receives a topic and a supervisor for the Master's thesis in good time.

(4) Registration for the Master's thesis usually takes place in the middle of the third semester.

(5) The processing time for the Master's thesis is 6 months. In special cases, upon written application of the candidate, the examination board may extend the processing time by a maximum of six weeks in agreement with the supervisor. In the case of a possible extension, attention must be paid to compliance with the standard period of study.

(6) The topic, task and scope of the Master's thesis shall be limited by the supervisor in such a way that the deadline for completing the Master's thesis can be met. The issue of the topic of the Master's thesis by the supervisor to the candidate shall be made via the examination board; § 10 Para. 3 shall apply accordingly. The date of issue shall be recorded in the records of the examination board. The topic may only be returned once and only within the first month of the processing period. A new topic shall be agreed upon without delay, but within four weeks at the latest; sentence 1 and paragraph 5 sentence 1 shall apply accordingly.

(7) The Master's thesis may be written in German or English.

(8) The Master's thesis may also be written in the form of a group work, provided the supervisor agrees to this in writing. The contribution of the individual candidate to be assessed as an examination performance must be clearly distinguishable as an individual examination performance on the basis of the specification of sections, page numbers or other objective

criteria and must be assessable in its own right and meet the requirements according to paragraph 1.

(9) The candidate shall submit the Master's thesis to the examination board in digital form within the time limit. If requested by the examiners, one bound version per examiner must also be submitted. The candidate must submit a written assurance in accordance with § 18 Para. 5 upon submission. The time of submission shall be recorded in the records. If the Master's thesis is not handed in on time in accordance with Paragraph 5, it shall be deemed to have been assessed as "insufficient" (5.0). If the Master's thesis is not submitted in the form according to sentences 1 and 2, it may be assessed as "not sufficient" (5.0).

(10) The examination board shall forward the Master's thesis to the supervisor as first examiner. At the same time, it appoints another assessor from the group of those entitled to conduct examinations according to § 8 Para. 2 for the second assessment and forwards the thesis to him or her. At least one of the assessors must be a professor of the relevant department of the University of Mainz.

(11) The submitted Master's thesis shall be evaluated by the examiners in accordance with the requirements of § 16 and one written report shall be prepared for each. If the evaluations of the two expert opinions differ from each other by up to one full grade level ( $\leq 1.0$ ), the overall grade shall be formed from the arithmetic mean of the two individual evaluations. If the grades of the two assessments differ by more than one full grade level ( $> 1.0$ ), the chairperson of the examination committee shall appoint a third examiner. Based on the three expert opinions, the chairperson of the examination board determines the final overall grade from the arithmetic mean. § Section 16, Paragraph 3 shall apply accordingly. The assessment procedure shall not exceed six weeks. If an examiner is unable to complete the assessment, the responsible examination board may appoint a substitute examiner.

(12) The Master's thesis is passed if the grade of the Master's thesis is at least "sufficient" (4.0). A Master's thesis assessed as "not sufficient" (5.0) or deemed to have been failed may be repeated once. The examination board shall ensure that the candidate receives a new topic for a Master's thesis within six weeks of the corresponding announcement. A return of the topic within the period specified in Paragraph 6 Sentence 4 is only permissible if the candidate did not make use of this option when writing his or her Master's thesis for the first time. A second repetition of the Master's thesis is not permitted.

## § 16

### Assessment of examination and study performance, Determination of the overall grade

(1) a. The following grades are to be used for the assessment of the individual examination performances and graded course performances:

1,0; 1,3	=	very good	=	an outstanding performance,
1,7; 2,0; 2,3	=	good	=	a performance that is significantly above the average requirements,
2,7; 3,0; 3,3	=	satisfactory	=	a performance that meets average requirements,
3,7; 4,0	=	sufficient	=	a performance which, despite its deficiencies, still meets the requirements,



5,0	=	not sufficient	=	a service that no longer meets the requirements due to significant deficiencies
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b. In the assessment of examination and study achievements that are not graded, the achievement is passed if it largely meets the requirements.

(2) If a module examination consists of a single examination, its grade is also the grade of the module examination. If the module examination consists of several examinations (partial module examinations), each examination must be passed. The grade of the module examination is calculated as a weighted average of the grades for the individual examinations. In this case, to determine the grade of the module examination, the grades for the individual partial module examinations are multiplied by the credit points assigned to them, added and divided by the total number of credit points included. The appendix may also provide for the formation of a grade from the arithmetic mean of the individual examination performances or, in justified individual cases, another method of calculating the module grade.

(3) In the case of an assessment by several examiners or a formation of the module grade in accordance with Paragraph 2 Sentences 2 to 5, the grade of the module examination with an average of:

1.0 up to and including 1.5	=	very good,
1.6 up to and including 2.5	=	good,
2.6 to 3.5 inclusive	=	satisfactory,
3.6 to 4.0 inclusive	=	sufficient,
above 4.1	=	not sufficient.

When calculating the module grades, only the first decimal place after the comma is taken into account, all other places are deleted without rounding.

(4) To determine the overall grade of the Master's examination, the grades for the individual module examinations according to Paragraphs 2 and 3 and the grade for the Master's thesis shall be multiplied by the respective credit points, added and divided by the total number of credit points included. In all other respects, paragraph 3 shall apply accordingly. Credit points from ungraded modules are not taken into account in the calculation.

## § 17

### Passing and failing, repeating examinations

1) A module examination is passed if the course work assigned to the module according to the appendix has been completed and the final module examination has been assessed with a pass or at least the grade "sufficient" (4.0). If the module examination consists of several examinations (partial module examinations), each examination must be passed.

(2) The Master's examination is passed if the module examinations according to § 11 for the modules prescribed according to § 6, Para. 2, Sentence 1, Nos. 1 and 2 have been successfully taken and the Master's thesis has been assessed with at least the grade "sufficient" (4.0).

(3) Mandatory and compulsory elective module examinations may be repeated a maximum of two times in all parts in which they have not been passed or are deemed to have been failed. A failed mandatory module examination cannot be replaced by another examination. In the

case of cumulative module examinations (partial module examinations), only the failed partial examinations may be repeated. The repetition of a passed examination is not permitted.

(4) In the case of failed mandatory elective module examinations, students may change the mandatory elective module once during the entire degree programme after the first, second or final failure. The student is given another three attempts for the new compulsory elective module examination in order to successfully complete the examination. A change back is excluded. The failed module examination will not be shown on the transcript after passing the change option. All other regulations of § 17 on passing and failing as well as repeating examinations remain unaffected by this.

(5) Failed examination performances or examination-relevant study performances in the same Master's degree programme at another higher education institution in Germany shall be taken into account as failed attempts in the permissible number of repeat examinations. Furthermore, failed examination performances and examination-relevant study performances in modules or examination areas of another degree programme at a higher education institution in Germany which essentially correspond to those in the Master's degree programme in Chemistry shall be taken into account as failed attempts, insofar as equivalent or lower requirements were set for their passing.

(6) The registration for the first repetition of a module examination or module sub-examination should be made within six months after its failure, the registration for the second repetition within six months after the failure of the first repetition. In justified individual cases, longer periods may be provided for, but no more than two years in total for the first and a second repetition. If deadlines for reporting the repetition of examinations are missed, the missed examinations shall be deemed to have been failed. § Section 4, subsection 3 shall apply.

(7) For the repetition of the Master's thesis, § 15, Para. 12 shall apply.

(8) If an examination can no longer be taken or repeated, the Master's examination is definitively failed and continuation of studies in the same Master's degree programme is no longer possible and the examination entitlement is lost. The examination board shall notify the candidate of this in writing. The notification of the final failure of the Master's examination and the associated loss of the examination entitlement shall be provided with a legal aid instruction.

## § 18

### **Absence, withdrawal, deception, violation of regulations**

(1) If the candidate fails to appear at a duly set and notified date without good reason or if he or she withdraws after the start of the examination without good reason, the respective examination performance shall be graded as "not sufficient" (5.0). Examinations are also deemed to have been failed if the candidate has not taken them within the prescribed time limits. The same applies if a written examination performance is not completed within the specified processing time.

(2) The reasons asserted for the failure to attend or the withdrawal pursuant to Paragraph 1 must be notified to the examination committee in writing without delay and must be made credible. If the examination committee recognises the reasons, a new date shall be set. In this case, any examination results already available shall be taken into account. If the candidate misses or withdraws from the examination due to illness, this must be proven by a medical certificate. The candidate must submit the medical certificate to the responsible examination board immediately, i.e. without culpable hesitation, at the latest by the third working day after the examination date or, in the case of an extension of the processing time of a term paper or

Master's thesis, on the third working day after the certified onset of illness. In the case of an inability to take the examination for the first time, a simple medical certificate without further details is usually sufficient, which only certifies the inability to take the examination from a medical point of view. In the case of a repetition, the submission of a qualified medical certificate, which certifies the time of the medical treatment, type, extent and duration of the illness as well as its effects on the ability to take the examination, or a medical officer's certificate without this information, may be required. An obligation to state the medical diagnosis is not permissible. The candidate's illness shall be deemed equivalent to the illness of a child or relative in need of care for whom the candidate is predominantly responsible on his/her own. If the reasons are recognised, the examination shall be taken at the next possible examination date after they have ceased to exist.

(3) If the candidate attempts to influence the result of an examination by deception or the use of unauthorised aids, or if a declaration pursuant to Paragraph 5 proves to be untrue, the examination performance in question shall be deemed to have been passed with an "insufficient" (5.0). Reference is made to § 7, Paragraph 7. If a candidate disrupts the orderly conduct of an examination, he or she may be excluded from continuing the examination performance by the respective examiner or invigilator, as a rule after a warning; in this case, the examination performance in question shall be deemed to have been passed with an "insufficient" (5.0).

(4) The candidate may demand within a period of one month that decisions pursuant to Paragraph 3 Sentences 1 and 3 be reviewed by the examination board. Incriminating decisions shall be communicated to the candidate in writing without delay, reasons shall be given and an appeal notice shall be provided. The candidate shall be given the opportunity to comment before a decision is made.

(5) In the case of written examinations pursuant to § 13 (with the exception of tests) and in the case of the Master's thesis pursuant to § 15, the student must include a written declaration when submitting the thesis that the thesis was written independently and that only the specified sources and aids were used, that the thesis was not already submitted as an examination in an identical form or with substantially the same content, and that the regulations for ensuring good academic practice in research and teaching and for the procedure for dealing with academic misconduct have been taken note of. If such a declaration proves to be untrue or if there is any other attempt at cheating or a breach of regulations in the performance of examinations, paragraphs 3 and 4 shall apply accordingly.

(6) The provisions of paragraphs 1 to 5 shall apply accordingly to coursework.

## § 19

### Report, certificate, diploma supplement

(1) If a candidate has passed the Master's examination, he or she shall receive a certificate on the results without delay, as a rule within six weeks after the last examination performance passed. The certificate shall contain the grades of the module examinations, the Master's thesis and the overall grade (§ 16 Para. 4). The credit points earned in each case shall be stated. Furthermore, the certificate shall contain the topic of the Master's thesis. If module examinations are taken and recognised at another higher education institution, the name of the higher education institution at which the module examinations were taken shall be stated in the transcript. In addition to the overall grade, grade distribution tables according to the ECTS (European Credit Transfer and Accumulation System) guidelines are issued, provided

that the necessary data are available. Additional study and examination achievements that are not compulsory are certified in an appropriate manner; such achievements are not counted towards the overall grade.

(2) The certificate shall bear the date of the day on which the last performance required to pass the Master's degree (module completion, internship, Master's thesis) was achieved. The certificate shall be signed by the chairperson of the examination board and bear the stamp of the department or the seal of the state.

(3) At the same time as the certificate, the candidate shall be issued with a certificate attesting to the award of the degree of Master of Science. The certificate shall bear the date of the transcript. It is signed by the chairperson of the examination board and the dean of the department and bears the stamp of the department or the seal of the state.

(4) In addition, the graduate shall receive a Diploma Supplement in accordance with the international requirements; the text agreed between the German Rectors' Conference and the Standing Conference of the Ministers of Education and Cultural Affairs in the respective valid version shall be used. It shall be signed by the chairperson of the examination board.

(5) The certificate, diploma and diploma supplement shall be written in German and English. The use of electronic signatures or facsimile stamps is permitted for certificates, diplomas and diploma supplements.

(6) Students who leave the university without a degree or who continue their studies at the university in another degree programme shall, upon application and upon presentation of the relevant evidence, receive a summary certificate of study and examination achievements (Transcript of Records). The application must be submitted in writing to the examination board, enclosing the necessary documents.

## § 20

### Invalidity of the Master's examination

(1) If the candidate has cheated in a course of study or examination performance and this fact only becomes known after the certificate has been issued, the examination board may subsequently correct the marks for those course of study or examination performances in the performance of which the candidate cheated and declare the examination or course performance wholly or partially failed. The examiners shall be heard beforehand.

(2) If the requirements for admission to an examination were not fulfilled without the candidate intending to deceive, and if this fact only becomes known after the certificate has been issued, this defect shall be remedied by passing the examination. If the candidate has intentionally obtained admission unlawfully, the examination board shall decide in accordance with the federal state Administrative Procedure Act.

(3) The candidate shall be given the opportunity to comment before a decision is taken.

(4) The incorrect examination certificate, the Diploma Supplement and, if applicable, the corresponding Transcript of Records shall be withdrawn and, if necessary, reissued. The Master's certificate shall also be withdrawn with these documents if the examination was declared "failed" due to an act of deception. A decision according to paragraph 1 and paragraph 2 sentence 2 is excluded after a period of two years from the date of the examination certificate, in the case of the Master's thesis after five years.

## **§ 21 Objection**

An appeal against examination decisions can be filed in writing with the chairperson of the examination committee within the time limit after the announcement of the examination decision. The responsible examination board decides on the appeal. In the case of an appeal against an examiner's assessment, the examiner's opinion will be sought.

## **§ 22 Right to information of the candidate**

- (1) The candidate may obtain information on the results (grades) of his/her study and examination performance before completing the Master's examination.
- (2) Upon written request, the candidate shall be granted access to his or her examination files, including the Master's thesis and the related reports, and to the examination records. Inspection is also possible if the Master's examination has not yet been completed.
- (3) The application shall be submitted to the chairperson of the examination board within one year after the completion of an examination. The chairperson of the examination board shall determine the place and time of inspection.

## **§ 23 Examination administration system**

- (1) Examination administration is generally carried out using an electronic examination administration system. This includes, in particular, registration and deregistration for courses and examinations, the transmission of documents and the announcement of the results of study and examination achievements.
- (2) Students are obliged to regularly use the integrated study and examination administration system and the personal e-mail account provided by JGU Mainz.

## **§ 24 Coming into effect of the regulations**

These regulations shall enter into force on the day following their publication in the State Bulletin for Rhineland-Palatinate.

Mainz, 27 August 2015

The Dean  
of the Faculty 09  
of the Johannes Gutenberg University Mainz  
Univ.-Prof. Dr. Dirk Schneider

Information without guarantee

## Appendix to §§ 5, 6, 11-14, 16 and 17: Structure of the study programme, modules

A total of seven specialisations are offered in the first and second semesters, each consisting of four modules of 6 LP. Two of the specialisations must be chosen. In addition, three compulsory elective modules of 6 LP each must be completed in the first to third semesters. The range of compulsory elective modules consists of the modules of the specialisations not taken as well as further elective modules that are not part of a specialisation.

In the third semester, two research modules are completed, which are selected according to the admission requirements and can both be in the same subject. The two research modules and one compulsory elective module can also be completed as part of an organised stay abroad. In this case, four months abroad correspond to two research modules. In the case of a six-month stay abroad, two research modules and the compulsory elective module corresponding to the subject of the semester abroad are recognised as equivalent.

The admission of further compulsory elective modules by the Examination Committee is possible, provided that the Examination Committee, in agreement with the relevant department, has determined the study and examination achievements to be made. For these modules, a sufficient range of courses as well as the possibility of examination must be ensured; the specified course and examination achievements must essentially correspond to those of the other modules in terms of scope and requirements. The approved modules shall be announced in an appropriate manner. Changes to the study and examination requirements require renewed approval by the examination board. The examination board may revoke the approval of these further modules, but in doing so, the students who have already taken up the study of this module shall be enabled to complete their studies in an orderly manner.

## 1. Overview of the specialisations and their modules

### 1. Specialisation: Applied Analytical Chemistry

Module 1.1: Applied Analytical Chemistry

Module 1.2: Trace Analysis I

Module 1.3: Trace Analysis II

Module 1.4: Radiochemical Analysis

### 2. Specialisation: Nuclear Chemistry

Module 2.1: Introduction in Nuclear Chemistry

Module 2.2: Lab Course Nuclear Chemistry 1

Module 2.3: Modern Methods and Applications of Nuclear and Radiochemistry

Module 2.4: Chemistry and Physics of Actinides and Transactinides

Module 2.5: Radiopharmaceutical Chemistry

Module 2.6: Internship at the Nuclear Reactor

Without theoretical and practical skills in the subject of nuclear chemistry, the major in nuclear chemistry consists of the modules 2.1, 2.2, 2.3 and optionally of the module 2.4 or 2.5.

If there are only theoretical but no practical skills in the subject of nuclear chemistry, the specialisation in nuclear chemistry consists of the four modules 2.2 to 2.5.

With theoretical and practical skills in nuclear chemistry, the major in nuclear chemistry consists of the modules 2.3 to 2.6.

### **3. Specialisation: Macromolecular Chemistry**

Module 3.1: Modern and Industrial Aspects of Polymer Materials

Module 3.2: Practical Course Modern Aspects of Macromolecular Chemistry

Module 3.3: Colloid Chemistry and Medical Polymers

Module 3.4: Complex (Supra)Molecular Systems and Biopolymers

### **4. Specialisation: Matter, Materials and Methods**

Module 4.1: Biophysical Chemistry

Module 4.2: Modern Methods of Physical Chemistry

Module 4.3: Condensed Matter

Module 4.4: Internship Modern Methods of Spectroscopy and Microscopy

### **5. Specialisation: Molecular Functional Materials**

Module 5.1: Electrons in Molecules

Module 5.2: Molecular Photochemistry

Module 5.3: Supramolecular Catalysis

Module 5.4: Advanced Laboratory Course on Functional Molecular Materials

### **6. Specialisation: Preparative chemistry**

Module 6.1: Chemistry of Aromatic / Heterocyclic Compounds

Module 6.2: Electrochemistry

Module 6.3: Chemistry of Natural Products

Module 6.4: Integrated Analytical-Preparative Lab Course

Module 6.5: Practical Course on Molecular Synthesis

Modules 6.2 and 6.3 are not selectable together, but only alternatively.

### **7. Specialisation: Theoretical Chemistry and Computer Chemistry**

Module 7.1: Principles of Quantum Chemistry

Module 7.2: Contemporary Topics of Theoretical Chemistry

Module 7.3: Practical Computational Chemistry

Module 7.4: Programming in Quantum Chemistry

## **2. Overview of the additional modules**

### **2.1 Elective Modules**

Module 32: Inorganic Solid State Chemistry

Module 33: Bioinorganic Chemistry

Module 34: Practical Course Electrochemistry



Module 35: Macromolecular Chemistry

Module 36: Practical Course Macromolecular Chemistry

**Module 37: Biomolecules, Biocatalysis and Signal Transfer**

Module 38: Metabolic Biochemistry

Module 39: Molecular and Cellular Biochemistry

Module 40: Biochemical Methods

**Module 41: Biochemical Working Techniques**

Module 42: Practical Course in Molecular Biology and Biochemistry

### 2.2 Mandatory Modules

Module 43: Research Project

Module 44: Master Thesis

available only in German language

## 3. Module descriptions

The following module descriptions regulate the details of the modules. Further information can be found in the respective valid module handbook.

Abbreviations used:	
<b>HS</b>	= Main Seminar
<b>LP</b>	= Creditpoint
<b>S</b>	= Seminar
<b>M</b>	= Mandatory Course
<b>Pr</b>	= Practical Course
<b>PrS</b>	= Proseminar
<b>SWH</b>	= Semester week hour (s)
<b>E</b>	= Exercise
<b>L</b>	= Lecture
<b>WP</b>	= Elective Course

## Specialisations

Module 1.1	1.1 Applied Analytical Chemistry						[Modul-Kennnummer ]
Mandatory or elective Module	Mandatory in the Specialisation „Advanced Analytical Chemistry“ or elective						
Creditpoints (LP) and workload	6 LP = 180 h						
Module duration (according to course plan)	1 Semester						
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	
a) Lecture „Environmental Analytical Chemistry“	L	2 (1)	M	2	69 h	3	
b) Lecture „Tools for Materials Analysis“	L	2 (1)	M	2	69 h	3	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							

Compulsory Attendance	
Active participation	According to § 5 para. 3
Coursework	
Module examination	Usually written exam (120 min), alternatively oral exam (30 min) on the contents of a) and b)
Entrance Requirements	
Reasons for compulsory attendance	
Language(s) of instruction and examination	German or English

<b>Module 1.2</b>	<b>1.2 Trace Analysis I</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	<b>M in the Specialisation „Advanced Analytical Chemistry“ or elective</b>						
<b>Creditpoints (LP) and workload</b>	<b>6 LP = 180 h</b>						
<b>Module duration</b> (according to course plan)	<b>1 Semester</b>						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Inorganic Trace and Species Analysis“	L	1 (2)	M	2	69 h	3	
b) Lecture „Organic Trace Analysis“	L	1 (2)	M	2	69 h	3	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min) on the contents of a) and b)						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	German or English						

<b>Module 1.3</b>	<b>1.3 Trace Analysis II</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	<b>M in Specialisation „Advanced Analytical Chemistry“ or elective</b>						
<b>Creditpoints (LP) and workload</b>	<b>6 LP = 180 h</b>						
<b>Module duration</b> (according to course plan)	<b>1 Semester</b>						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Practical course „Trace Analysis II“	APr	2 (1)	M	4	78 h	4	
b) Supporting Seminar to a)	S	2 (1)	M	2	39 h	2	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	APr, S						
Active participation	According to § 5 para. 3						
Coursework							
Module examination							

Entrance Requirements	Module „Trace Analysis I“
Reasons for compulsory attendance	According to HochSchG § 26 para. 2 (7), Practical Course; Practical Course accompanying upper seminar according to § 5 Abs. 5: Discussion of safety-relevant details of and discussion of practical course experiments.
Language(s) of instruction and examination	German or English

<b>Module 1.4</b>	<b>1.4 Radiochemical Analysis</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	<b>Mandatory in the Specialisation „Advanced Analytical Chemistry“ or elective</b>						
<b>Creditpoints (LP) and workload</b>	<b>6 LP = 180 h</b>						
<b>Module duration (according to course plan)</b>	<b>1 Semester</b>						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Radiochemical Analysis“	L	1 (2)	M	3	103,5 h	4,5	
b) Supporting practical exercise to a)	E	1 (2)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	E						
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)						
Entrance Requirements	Module „Trace Analysis I“						
Reasons for compulsory attendance	According to HochSchG § 26 para. 2 (7), Practical Course; Practical Course accompanying upper seminar according to § 5 Abs. 5: Discussion of safety-relevant details of and discussion of practical course experiments.						
Language(s) of instruction and examination	German or English						

<b>Module 2.1</b>	<b>2.1 Introduction in Nuclear Chemistry</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Nuclear Chemistry“ (without prior knowledge) or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Introduction in Nuclear Chemistry“	L	1 or 2 (1 or 2)	M	2	69 h	3	
b) Supporting exercise to a)	E	1 or 2 (1 or 2)	M	1	34,5 h	1,5	
c) Supporting Seminar to a)	S	1 or 2 (1 or 2)	M	1	34,5	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	S						
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)						
Entrance Requirements							
Reasons for compulsory attendance	Seminar according to § 5 para. 5: The learning objectives are based on direct interaction between students. In addition to practical professional competence, important learning objectives are literature research, presentation and discussion skills.						

<b>Module 2.2</b>	<b>2.2 Lab Course Nuclear Chemistry 1</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Nuclear Chemistry“ (without or only with theoretical prior knowledge) or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lab Course „Nuclear Chemistry 1“	APr	1 or 2 (1 or 2)	P	6	72 h	4,5	
b) Supporting Seminar to a)	S	1 or 2 (1 or 2)	P	1	34,5h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	APr, S						
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Oral exam (30 minutes, not graded)						
Entrance Requirements	Module „Introduction in nuclear Chemistry“						
Reasons for compulsory attendance	In accordance with HochSchG § 26 para. 2 (7), practical course; seminar accompanying practical course in accordance with § 5 para. 5: discussion of safety-relevant details of and discussion of practical course experiments.						

<b>Module 2.3</b>	<b>2.3 Modern Methods and Applications of Nuclear and Radiochemistry</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Nuclear Chemistry“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						

Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints
a) Lecture „Modern Methods and Applications of Nuclear and Radiochemistry“	L	1(2)	M	3	103,5 h	4,5
b) Supporting exercise to a)	E	1(2)	M	1	34,5 h	1,5
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance						
Active participation	According to § 5 para. 3					
Coursework						
Module examination	Usually oral exam (30 min), alternatively written exam (120 min)					
Entrance Requirements						
Reasons for compulsory attendance						
Language(s) of instruction and examination	German or English					

Module 2.4	2.4 Chemistry and Physics of Actinides and Transactinides						[Modul-Kennnummer ]
Mandatory or elective Module	Mandatory in the specialisation „Nuclear chemistry“ (with only theoretical prior knowledge or with theoretical and practical prior knowledge) or elective						
Creditpoints (LP) and workload	6 LP = 180 h						
Module duration (according to course plan)	1 Semester						
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	
a) Lecture „Chemistry and Physics of Actinides and Transactinides“	L	2 (1)	M	3	103,5 h	4,5	
b) Supporting exercise to a)	E	2 (1)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually oral exam (30 min), alternatively written exam (120 min)						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	German or English						

Module 2.5	2.5 Radiopharmaceutical Chemistry						[Modul-Kennnummer ]
Mandatory or elective Module	Mandatory in the specialisation „Nuclear Chemistry“ (with only theoretical prior knowledge or with theoretical and practical prior knowledge) or elective in the specialisation „Nuclear Chemistry“ (without prior knowledge) or elective						
Creditpoints (LP) and workload	6 LP = 180 h						
Module duration (according to course plan)	2 Semesters						

Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints
a) Lecture „Radiopharmaceutical Chemistry 1“	L	1 (2)	M	2	69h	3
b) Lecture „Radiopharmaceutical Chemistry 2“	L	2 (1)	M	2	69 h	3
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance						
Active participation	According to § 5 para. 3					
Coursework						
Module examination	Usually oral exam (30 min), alternatively written exam (120 min) on the contents of a) and b)					
Entrance Requirements						
Reasons for compulsory attendance						
Language(s) of instruction and examination	German or English					

Module 2.6	2.6 Internship at the Nuclear Reactor						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	<b>Mandatory in the specialisation „Nuclear Chemistry“ (with prior knowledge) or elective</b>						
<b>Creditpoints (LP) and workload</b>	<b>6 LP = 180 h</b>						
<b>Module duration</b> (according to course plan)	<b>1 Semester</b>						
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	
a) Practical Course „Internship at the Nuclear Reactor“	APr	1 or 2 (1 or 2)	M	6	117 h	6	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	APr						
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Oral exam (30 min), not graded						
Entrance Requirements	Module „Introduction to Nuclear Chemistry“, Background check according to § 12 AtG min. 8 weeks before the start of the Practical Course						
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical Course						
Language(s) of instruction and examination	German or English						

Module 3.1	3.1 Modern and Industrial Aspects of Polymer Materials						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	<b>Mandatory in the specialisation „Macromolecular Chemistry“ or elective</b>						
<b>Creditpoints (LP) and workload</b>	<b>6 LP = 180 h</b>						
<b>Module duration</b> (according to course plan)	<b>1 Semester</b>						
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	

a) Lecture Part 1: "Synthesis and Use of Polymer Materials" Part 2: "Physical Chemistry of Polymeric Materials"	L	1 (2)	M	3	103,5 h	4,5
b) Seminar „Modern and Industrial Aspects of Polymer Materials“	S	1 (2)	M	1	34,5 h	1,5
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance						
Active participation	According to § 5 para. 3 (usually successful delivery of a presentation in the Seminar)					
Coursework						
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)					
Entrance Requirements						
Reasons for compulsory attendance						
Language(s) of instruction and examination	English					

<b>Module 3.2</b>	<b>3.2 Practical Course Modern Aspects of Macromolecular Chemistry</b>					[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Macromolecular Chemistry“ or elective					
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h					
<b>Module duration</b> (according to course plan)	1 Semester					
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>
a) Practical Course “Macromolecular Chemistry 2”	APr	1 or 2 (1 or 2)	M	6	117 h	6
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance	APr					
Active participation	According to § 5 para. 3 (including preliminary discussion, protocols)					
Coursework						
Module examination						
Entrance Requirements						
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical Course					
Language(s) of instruction and examination	English					

<b>Module 3.3</b>	<b>3.3 Colloid Chemistry and Medical Polymers</b>					[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Macromolecular Chemistry“ or elective					
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h					
<b>Module duration</b> (according to course plan)	1 Semester					
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>
a) Lecture „Colloid Chemistry“	L	1 (2)	M	2	69 h	3
b) Lecture „Medically relevant polymers“	L	1 (2)	M	2	69 h	3

In order to complete the module, you have to fulfil the following requirements:	
Compulsory Attendance	
Active participation	According to § 5 para. 3
Coursework	
Module examination	a) Usually written exam (60 min), alternatively oral exam (30 min) b) Usually written exam (60 min), alternatively oral exam (30 min). Both exams must be passed, the module grade results from the arithmetic mean of both exams.
Entrance Requirements	
Reasons for compulsory attendance	
Language(s) of instruction and examination	German or English

Module 3.4	3.4 Complex (Supra)Molecular Systems and Biopolymers						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Macromolecular Chemistry“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	
a) Lecture „Complex (Supra)Molecular Systems“	L	2 (1)	M	2	69 h	3	
b) Lecture „Biopolymers“	L	2 (1)	M	2	69 h	3	
In order to complete the module, you have to fulfil the following requirements:							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework							
Module examination	a) Usually written exam (60 min), alternatively oral exam (30 min) b) Usually written exam (60 min), alternatively oral exam (30 min). Both exams must be passed, the module grade results from the arithmetic mean of both exams.						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	German or English						

Module 4.1	4.1 Biophysical Chemistry						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Matter, Materials and Methods“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	
a) Lecture „Biophysical Chemistry“	L	2 (1)	M	2	69 h	3	
b) Supporting exercise to a)	E	2 (1)	M	2	69 h	3	



Um das Modul abschließen zu können sind folgende Leistungen zu erbringen:	
Compulsory Attendance	
Active participation	According to § 5 para. 3
Coursework	
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)
Entrance Requirements	
Reasons for compulsory attendance	
Language(s) of instruction and examination	German or English

Module 4.2	4.2 Modern Methods of Physical Chemistry						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Matter, Materials and Methods“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	
a) Lecture „Modern Methods of Physical Chemistry“	L	1 or 2 (1 or 2)	P	3	103,5h	4,5	
b) Supporting exercise to a)	E	1 or 2 (1 or 2)	P	1	34,5 h	1,5	
In order to complete the module, you have to fulfil the following requirements:							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	German or English						

Module 4.3	4.3 Condensed Matter						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Matter, Materials and Methods“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	
a) Lecture „Condensed Matter“	L	1 (2)	M	2	69 h	3	
b) Supporting Seminar to a)	S	1 (2)	M	2	69 h	3	
In order to complete the module, you have to fulfil the following requirements:							
Compulsory Attendance							
Active participation							
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)						
Entrance Requirements							
Reasons for compulsory attendance							

Language(s) of instruction and examination	English
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<b>Module 4.4</b>	<b>4.4 Practical Course Modern Methods of Spectroscopy and Microscopy</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Matter, Materials and Methods“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Practical Course “Modern Methods of Spectroscopy and Microscopy”	Apr	1 or 2 (1 or 2)	M	3	103,5 h	4,5	
b) Supporting seminar to a)	S	1 or 2 (1 or 2)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	APr						
Active participation	According to § 5 para. 3						
Coursework							
Module examination							
Entrance Requirements							
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical Course						
Language(s) of instruction and examination	German or English						

<b>Module 5.1</b>	<b>5.1 Electrons in Molecules</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Molecular Functional Materials“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Electrons in Molecules”	L	1 (2)	M	3	103,5 h	4,5	
b) Supporting exercise to a)	E	1 (2)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	German or English						

<b>Module 5.2</b>	<b>5.2 Molecular Photochemistry</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Molecular functional Materials“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Molecular Photochemistry“	L	1 (2)	M	3	103,5 h	4,5	
b) Supporting exercise to a)	E	1 (2)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	German or English						

<b>Module 5.3</b>	<b>5.3 Supramolecular Catalysis</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Molecular functional Materials“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Supramolecular Catalysis“	L	2 (1)	M	3	103,5 h	4,5	
b) Supporting exercise to a)	E	2 (1)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	German or English						

<b>Module 5.4</b>	<b>5.4 Advanced Laboratory Course on Functional Molecular Materials</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Molecular Functional Materials“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						

Module duration (according to course plan)		1 Semester				
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints
a) Lab Course „Functional Molecular Materials“	APr	2 (1)	M	9	40,5 h	4,5
b) Supporting Seminar to a)	S	2 (1)	M	1	34,5 h	1,5
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance	APr, S					
Active participation	According to § 5 para. 3					
Coursework						
Module examination						
Entrance Requirements						
Reasons for compulsory attendance	According to HochSchG § 26 para. 2 (7), Practical Course; Practical Course accompanying upper seminar according to § 5 para. 5: discussion of safety-relevant details of and discussion of practical course experiments.					
Language(s) of instruction and examination	German or English					

Module 6.1	6.1 Chemistry of Aromatic / Heterocyclic Compounds					[Modul-Kennnummer ]
Mandatory or elective Module	Mandatory in the specialisation „Preparative Chemistry“ or elective					
Creditpoints (LP) and workload	6 LP = 180 h					
Module duration (according to course plan)	1 Semester					
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints
a) Lecture „Aromatics / Heterocycles“	L	1 or 2 (1 or 2)	M	2	69 h	3
b) Supporting exercise to a)	E	1 or 2 (1 or 2)	M	1	34,5 h	1,5
c) Seminar “Practical Seminar”	S	1 or 2 (1 or 2)	M	1	34,5 h	1,5
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance	S					
Active participation	According to § 5 para. 3					
Coursework						
Module examination	Usually written exam (120 min), alternatively oral exam (30 min) on the contents of a) and b)					
Entrance Requirements						
Reasons for compulsory attendance	Seminar according to § 5 para. 5: The learning objectives are based on direct interaction between students. In addition to practical professional competence, important learning objectives are literature research, presentation and leading discussions.					
Language(s) of instruction and examination	German or English					

Module 6.2	6.2 Electrochemistry					[Modul-Kennnummer ]
Mandatory or elective Module	Mandatory in the specialisation „Preparative Chemistry“ or elective					
Creditpoints (LP) and workload	6 LP = 180 h					

<b>Module duration</b> (according to course plan)		<b>1 Semester</b>				
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>
a) Lecture „Electrochemistry”	L	2 (1)	M	4	138 h	6
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance						
Active participation	According to § 5 para. 3					
Coursework						
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)					
Entrance Requirements						
Reasons for compulsory attendance						
Language(s) of instruction and examination	German or English					

<b>Module 6.3</b>	<b>6.3 Chemistry of Natural Products</b>					[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Preparative Chemistry“ or elective					
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h					
<b>Module duration</b> (according to course plan)	<b>1 Semester</b>					
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>
a) Lecture „Chemistry of Natural Products”	L	2 (1)	M	2	69 h	3
b) Supporting exercise to a)	E	2 (1)	M	1	34,5 h	1,5
c) Seminar “Retrosynthesis”	S	2 (1)	M	1	34,5 h	1,5
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance						
Active participation	According to § 5 para. 3					
Coursework						
Module examination	Usually written exam (120 min), alternatively oral exam (30 min) on the contents of a), b) and c)					
Entrance Requirements						
Reasons for compulsory attendance						
Language(s) of instruction and examination	German or English					

<b>Module 6.4</b>	<b>6.4 Integrated Analytical-Preparative Lab Course</b>					[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Preparative Chemistry“ or elective					
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h					
<b>Module duration</b> (according to course plan)	<b>1 Semester</b>					
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>
a) Lecture „Analytical Methods”	L	1 or 2 (1 or 2)	M	1	34,5 h	1,5

b) Analytical Preparative Lab Course	APr	1 or 2 (1 or 2)	M	9	40,5 h	4,5
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance	APr					
Active participation	According to § 5 para. 3					
Coursework						
Module examination						
Entrance Requirements						
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical Course					
Language(s) of instruction and examination	German or English					

<b>Module 6.5</b>	<b>6.5 Practical Course on Molecular Synthesis</b> [Modul-Kennnummer]					
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Preparative Chemistry“ or elective					
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h					
<b>Module duration</b> (according to course plan)	1 Semester					
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>
a) Practical Course on Molecular Synthesis	APr	1 or 2 (1 or 2)	M	12	54 h	6
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance	APr					
Active participation	According to § 5 para. 3					
Coursework						
Module examination						
Entrance Requirements						
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical Course					
Language(s) of instruction and examination	German or English					

<b>Module 7.1</b>	<b>7.1 Principles of Quantum Chemistry</b> [Modul-Kennnummer]					
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Theoretical Chemistry and Computer Chemistry“ or elective					
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h					
<b>Module duration</b> (according to course plan)	1 Semester					
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>
a) Lecture „Principles of Quantum Chemistry“	L	1 (2)	M	3	103,5 h	4,5
b) Supporting exercise to a)	E	1 (2)	M	1	34,5 h	1,5
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance						
Active participation	According to § 5 para. 3					
Coursework						
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)					

Entrance Requirements	
Reasons for compulsory attendance	
Language(s) of instruction and examination	German or English

<b>Module 7.2</b>	<b>7.2 Contemporary Topics of Theoretical Chemistry</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Theoretical Chemistry and Computer Chemistry“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Contemporary Topics of Theoretical Chemistry“	L	2 (1)	M	3	103,5 h	4,5	
b) Supporting exercise to a)	E	2 (1)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	German or English						

<b>Module 7.3</b>	<b>7.3 Practical Computational Chemistry</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory in the specialisation „Theoretical Chemistry and Computer Chemistry“ or elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Practical Course Computer Chemistry	APr	2 (1)	M	3	103,5 h	4,5	
b) Supporting Seminar to a)	S	2 (1)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	APr, S						
Active participation	According to § 5 para. 3						
Coursework							
Module examination							
Entrance Requirements							
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical course; Practical course accompanying upper seminar according to § 5 Para. 5: Discussion of the tasks to be carried out or carried out in the practical course with the help of licensed programmes on computers within the working group.						

Language(s) of instruction and examination	German or English
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<b>Module 7.4</b>	<b>7.4 Programming in Quantum Chemistry</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	<b>Mandatory in the specialisation „Theoretical Chemistry and Computer Chemistry“ or elective</b>						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Practical Course „Programming in Quantum Chemistry“	Apr	1 (2)	M	3	103,5 h	4,5	
b) Supporting Seminar to a)	S	1 (2)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	Apr, S						
Active participation	According to § 5 para. 3						
Coursework							
Module examination							
Entrance Requirements							
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical course; Practical course accompanying upper seminar according to § 5 Para. 5: Discussion of the tasks to be carried out or carried out in the practical course with the help of licensed programmes on computers within the working group.						
Language(s) of instruction and examination	German or English						

<b>Module 32</b>	<b>Elective Module 32 Inorganic Solid State Chemistry</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	<b>Elective</b>						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Solid State Chemistry“	L	1 or 3 (2)	M	3	103,5 h	4,5	
b) Supporting Seminar to a)	S	1 or 3 (2)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework	Written elaboration of the seminar presentation						
Module examination	Oral exam (30 min) on the contents of a) and b)						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	German or English						



<b>Module 33</b>	<b>Elective Module 33 Bioinorganic Chemistry</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Bioinorganic Chemistry“	L	2 (1 or 3)	M	3	103,5 h	4,5	
b) Supporting Seminar to a)	S	2 (1 or 3)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	S						
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min) on the contents of a)						
Entrance Requirements							
Reasons for compulsory attendance	Upper seminar according to § 5 para. 5: The learning objectives are based on direct interaction between students. In addition to practical professional competence, important learning objectives are literature research, presentation and leading discussions.						
Language(s) of instruction and examination	German or English						

<b>Module 34</b>	<b>Elective Module 34 Practical Course Electrochemistry</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Practical Course Electrochemistry	APr	2 (1 or 3)	M	6	117 h	6	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	APr						
Active participation	According to § 5 para. 3						
Coursework							
Module examination							
Entrance Requirements							
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical Course						
Language(s) of instruction and examination	German or English						

<b>Module 35</b>	<b>Elective Module 35 Macromolecular Chemistry</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Elective						

<b>Creditpoints (LP) and workload</b>	6 LP = 180 h					
<b>Module duration</b> (according to course plan)	1 Semester					
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>
a) Lecture Part 1: "Synthesis and use of polymers". Part 2: "Physical Chemistry of Polymers".	L	1 - 3 (1 - 3)	M	3	103,5 h	4,5
b) Supporting exercise to a)	E	1 - 3 (1 - 3)	M	1	34,5 h	1,5
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance						
Active participation	b) According to § 5 para. 3 (usually exercise assignments)					
Coursework						
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)					
Entrance Requirements						
Reasons for compulsory attendance						
Language(s) of instruction and examination	English					

<b>Module 36</b>	<b>Elective Module 36 Practical Course Macromolecular Chemistry</b>					[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Elective					
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h					
<b>Module duration</b> (according to course plan)	1 Semester					
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>
a) Practical Course Advanced Macromolecular Chemistry 1	APr	1 - 3 (1 - 3)	M	6	117 h	6
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance	APr					
Active participation	According to § 5 para. 3					
Coursework						
Module examination						
Entrance Requirements	Module „Macromolecular Chemistry“					
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical Course					
Language(s) of instruction and examination	German or English					

<b>Module 37</b>	<b>Elective Module 37 Biomolecules, Biocatalysis and Signal Transfer</b>					[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Elective					
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h					
<b>Module duration</b> (according to course plan)	1 Semester					

Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints
a) Lecture "Biomolecules, Biocatalysis and Signal Transfer	L	1 - 3 (1 - 3)	M	2	69 h	3
b) Supporting Seminar to a)	S	1 - 3 (1 - 3)	M	2	69 h	3
<b>In order to complete the module, you have to fulfil the following requirements:</b>						
Compulsory Attendance						
Active participation	According to § 5 para. 3					
Coursework						
Module examination	Usually written exam (120 min), alternatively oral exam (30 min) on the contents of a) and b)					
Entrance Requirements						
Reasons for compulsory attendance						

<b>Module 38</b>		<b>Elective Module 38 Metabolic Biochemistry</b>					[Modul-Kennnummer]
<b>Mandatory or elective Module</b>		Elective					
<b>Creditpoints (LP) and workload</b>		6 LP = 180 h					
<b>Module duration</b> (according to course plan)		1 Semester					
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	
a) Lecture „Metabolic Biochemistry“	L	1 - 3 (1 - 3)	M	2	69 h	3	
b) Supporting Seminar to a)	S	1 - 3 (1 - 3)	M	2	69 h	3	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min) on the contents of a) and b)						
Entrance Requirements							
Reasons for compulsory attendance							

<b>Module 39</b>		<b>Elective Module 39 Molecular and Cellular Biochemistry</b>					[Modul-Kennnummer]
<b>Mandatory or elective Module</b>		Elective					
<b>Creditpoints (LP) and workload</b>		6 LP = 180 h					
<b>Module duration</b> (according to course plan)		1 Semester					
Courses/ Learning formats	Type	Regular term when starting in Winter term (Summer term)	Mandatory/ elective	Contact Time (SWH)	Self Study	Creditpoints	
a) Lecture „Molecular and Cellular Biochemistry“	L	2 (1 or 3)	M	4	138 h	6	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3						

Coursework	
Module examination	Usually written exam (120 min), alternatively oral exam (30 min)
Entrance Requirements	
Reasons for compulsory attendance	
Language(s) of instruction and examination	German or English

<b>Module 40</b>	<b>Elective Module 40 Biochemical Methods</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Lecture „Methods of Biochemistry”	L	1 or 3 (2)	M	2	69 h	3	
b) Supporting Seminar to a)	S	1 or 3 (2)	M	2	69 h	3	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance							
Active participation	According to § 5 para. 3 b) The student elaborates and presents a given, current biochemical topic and engages in a discussion on the topic.						
Coursework							
Module examination	Usually written exam (120 min), alternatively oral exam (30 min) on the contents of a) and b)						
Entrance Requirements							
Reasons for compulsory attendance							
Language(s) of instruction and examination	English						

<b>Module 41</b>	<b>Elective Module 41 Biochemical Working Techniques</b>						[Modul-Kennnummer]
<b>Mandatory or elective Module</b>	Elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Advanced Practical Course „Biochemical Working Techniques”	APr	1 - 3 (1 - 3)	M	7	76,5 h	5	
b) Supporting Seminar to a)	S	1 - 3 (1 - 3)	M	1	19,5 h	1	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	Apr, S						
Active participation	According to § 5 para. 3						
Coursework							
Module examination							

Entrance Requirements	Elective Module 37 „Biomolecules, Biocatalysis and Signal Transfer” or Elective Module 38 “Metabolic Biochemistry”
Reasons for compulsory attendance	In accordance with HochSchG § 26 para. 2 (7), practical course; seminar accompanying practical course in accordance with § 5 para. 5: discussion of safety-relevant details of and discussion of practical course experiments.

<b>Module 42</b>	<b>Elective Module 42 Practical Course in Molecular Biology and Biochemistry</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Elective						
<b>Creditpoints (LP) and workload</b>	6 LP = 180 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Practical Course in Molecular Biology and Biochemistry	APr	1 - 3 (1 - 3)	M	9	40,5 h	4,5	
b) Supporting Seminar to a)	S	1 - 3 (1 - 3)	M	1	34,5 h	1,5	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	APr						
Active participation	According to § 5 para. 3						
Coursework							
Module examination							
Entrance Requirements	Elective Module 41 Biochemical Working Techniques						
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), Practical Course						
Language(s) of instruction and examination	German or English						

<b>Module 43</b>	<b>43 Research Project</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	Mandatory						
<b>Creditpoints (LP) and workload</b>	12 LP = 360 h						
<b>Module duration</b> (according to course plan)	1 Semester						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term when starting in Winter term (Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
a) Practical Course “Research Paper”	Apr	3 (3)	M	22	99,0 h	11	
b) Supporting Seminar "Guidance for independent scientific work"	S	3 (3)	M	1	19,5 h	1	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	Apr (according to the task and agreement with the supervisor)						
Active participation	According to § 5 para. 3, presentation on the research module (30 min)						
Coursework	Maintenance of a laboratory notebook						
Module examination	Research report						
Entrance Requirements	According to PO						
Reasons for compulsory attendance	According to HochSchG § 26 para. 2 (7), scientific (practical) research work/practical course (according to assignment and agreement with the supervisor).						

Language(s) of instruction and examination	German or English
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Research Project	Entrance Requirements
Specialisation Applied Analytical Chemistry	Trace Analysis 1
Specialisation Nuclear Chemistry	Lab Course in Nuclear chemistry 1 or practical experience in handling radioactive substances and radioanalytical measurement techniques amounting to 6 LP or comparable competences
Specialisation Macromolecular Chemistry	None
Specialisation Matter, Materials and Methods	None
Specialisation Molecular Functional Materials	None
Specialisation Preparative Chemistry	None
Specialisation Theoretical Chemistry and Computer Chemistry	None
Inorganic solid state chemistry	None
Bioinorganic Chemistry	None
Biochemistry	None
Electrochemie	None
Macromolecular Chemistry	None

Information without guarantee

<b>Module 44</b>	<b>44 Master Thesis</b>						[Modul-Kennnummer ]
<b>Mandatory or elective Module</b>	<b>Mandatory</b>						
<b>Creditpoints (LP) and workload</b>	<b>30 LP = 900 h</b>						
<b>Module duration</b> (according to course plan)	<b>1 Semester</b>						
<b>Courses/ Learning formats</b>	<b>Type</b>	<b>Regular term</b> when starting in <b>Winter term</b> <b>(Summer term)</b>	<b>Mandatory/ elective</b>	<b>Contact Time (SWH)</b>	<b>Self Study</b>	<b>Creditpoints</b>	
Master Thesis		4 (4)	M	6 months all day	900 h	30	
<b>In order to complete the module, you have to fulfil the following requirements:</b>							
Compulsory Attendance	Master thesis (according to assignment and agreement with the supervisor)						
Active participation	According to § 5 Para. 3, presentation on the Master's thesis (30 min)						
Coursework	Maintenance of a laboratory notebook						
Module examination	Master thesis						
Entrance Requirements	According to § 15 para. 4						
Reasons for compulsory attendance	According to HochSchG § 26 Para. 2 (7), scientific (practical) research work/internship (according to assignment and agreement with the supervisor).						
Language(s) of instruction and examination	German or English						