

University of Leipzig  
Faculty for Chemistry and Mineralogy

## **Study regulations for the joint international and English-taught Master's program with the title Advanced Spectroscopy in Chemistry leading to the degree Master of Science (M. Sc.) at the University of Leipzig.**

From May 16, 2018

Based on the Act on the Freedom of Higher Education Institutions in the Free State of Saxony (Sächsisches Hochschulfreiheitsgesetz - SächsHSFG) in the version published on January 15, 2013 (SächsGVBl. p. 3), last amended by Article 11 of the Act on Accompanying Regulations to the 2015/2016 biennial budget (Budgetary Laws 2015/2016 - HBG 2015/2016) of April 29, 2015 (SächsGVBl. p. 349), Leipzig University issued the following study regulations on October 5, 2017.

### **Table of contents:**

- § 1 Scope
- § 2 Admission requirements
- § 3 Start of studies
- § 4 Duration of studies, scope of studies and language of instruction
- § 5 Subjects and objectives of the studies
- § 6 Forms of instruction
- § 7 Tutorials
- § 8 Structure and contents of the program
- § 9 Studying abroad
- § 10 Modules of the Master's program
- § 11 Completion of the Master's program
- § 12 Student Advisory Service
- § 13 Effective date and release

### **Anlage**

Study plan / Module overview table / Module descriptions <sup>1</sup>

<sup>1</sup> Module descriptions are published exclusively in the electronic version of the Official Announcements on the homepage of the University of Leipzig.

---

## **§ 1**

### **Scope**

Based on the examination regulations for the international Master's program Advanced Spectroscopy in Chemistry, these study regulations govern the objectives, contents and structure of the international Master's program Advanced Spectroscopy in Chemistry leading to the degree of Master of Science (M.Sc.).

## **§ 2**

### **Admission requirements**

- (1) The general qualification for the research-oriented international Master's program Advanced Spectroscopy in Chemistry is proven by a first professional university degree or by a degree from a state or state-recognized university of cooperative education.
- (2) Subject-specific admission requirements are:
  - a Bachelor's degree in chemistry or
  - in another natural science or engineering subject with a comparable proportion of chemical content, or proof that in case of orderly progression of studies such a degree can be obtained by the start of the Master's program; as well as
  - English language skills according to the Common European Framework of Reference for Languages, level B2, or proof that these will be available by the start of the Master's program.
- (3) The fulfillment of the prerequisites mentioned in paragraphs 1 and 2 shall be verified by the faculty, which issues a decision in this regard. The decision serves as confirmation of the corresponding admission requirements.
- (4) Negative decisions in accordance with paragraph 3 should be justified and provided with appealing instructions. An appeal against negative decisions may be submitted within one month after notification. The objection must be submitted in writing or as record transcript to the Faculty of Chemistry and Mineralogy, which will decide on it within a period of 3 months.

## **§ 3**

### **Start of studies**

The study program can only be started at the beginning of the winter semester.

**§ 4****Duration of studies, scope of studies and language of instruction**

- (1) The standard period of study, including the Master's thesis, comprises 4 semesters. The total student workload for the international Master's program Advanced Spectroscopy in Chemistry corresponds to 120 credit points (CP).
- (2) The study program can also be pursued on a part-time basis. Further details are set by the inter-faculty regulations concerning part-time studies, in the respective current version of regulations.

**§ 5****Subjects and objectives of the studies**

- (1) The research-oriented international Master's program Advanced Spectroscopy in Chemistry is a consecutive Master's program.
- (2) The joint master program Advanced Spectroscopy in Chemistry has as its main focus on advanced spectroscopic methods. The methods NMR/ESR, MS, optical spectroscopy and X-ray structural analysis are of particular importance. Based on this deeper understanding of structural aspects, the synthesis of defined complex structures is also covered.
- (3) In particular, students should be capable of independent scientific thinking and working, and of successful problem solving in various fields of science and technology.
- (4) In the sense of chemistry as an interdisciplinary science, graduates should increasingly pay attention to the importance of connection with all areas of industry, business, government and society.
- (5) The Advanced Spectroscopy in Chemistry program ends with the Master of Science degree as a subsequent professional qualification.
- (6) The Master's program "Advanced Spectroscopy in Chemistry" is a joint Master's program with a dual degree with an integrated stay abroad at the universities in Lille, Bologna, Helsinki or Krakow.

## **§ 6**

### **Forms of instruction**

(1) Forms of instruction are:

- Lectures
- Seminars
- Exercises
- Practical courses und
- Colloquia.

In practical courses, students must experimentally implement the basic knowledge of chemical subjects acquired in lectures, seminars and exercises. A given task is to be solved within a given time using the methods and techniques known to them or described in the literature, in consultation with the supervisors/assistants of the practical course.

(2) The people responsible for the module can decide that a learning platform is to be used for sharing of the course learning materials to accompany the face-to-face studies.

## **§ 7**

### **Tutorials**

Within the limits of available resources tutorials are held to support students.

## **§ 8**

### **Structure and contents of the program**

- (1) The Master's program has a scope of 120 credit points, out of which 30 credit points are allotted to the Master's thesis. Details on the number of modules can be found in the appendix.
- (2) As a rule, 60 credit points are earned in each academic year. Credit points are awarded for passing module examinations. One credit point corresponds to a workload of 30 hours including attendance and self-study as well as preparation and execution of examinations. The total workload of the students should not exceed 1800 hours in the academic year including the lecture-free period. In the case of part-time study (§ 4 Abs. 2), the student workload is reduced according to the proportion of part-time study.

- (3) The program content is taught in modules. Modules contain definable subject areas that are related to each other in a subject- or topic-specific way. They include classes of different types that are aligned with each other and are concluded with module examinations. Modules designate a group of time-limited, self-contained, methodically or content-related classes. Modules are assigned credit points according to their workload. They are concluded with a module examination consisting of no more than 2 assessments, on the basis of which credit points are awarded. There are two basic forms of modules:
1. Compulsory/obligatory modules: All students must complete these.
  2. Elective course and elective practical courses: Students can choose within a thematically defined area.
- (4) The language of instruction is English. Special emphasis is placed on subject-specific English skills. This ensures foreign and German students a joint education with an international orientation, facilitates academic exchange, international scientific contacts as well as future scientific work abroad.
- (5) The Master's thesis is usually written during the second year of study. It is associated with a workload of 30 credit points.

## **§ 9 Studying abroad**

The Joint Master program described here is offered at 5 European universities at the same time and identical in its structure. The partner universities are:

University of Bologna  
University of Helsinki  
Jagiellonian University Krakow  
Leipzig University  
University of Science and Technology of Lille

A stay abroad of at least one semester is mandatory. All students start their studies in Lille. Thereafter, two different schemes are available for the student to choose from:

After that, two different schemes are available for the student to choose from:  
Mobility scheme 1: a single transfer after 2 semesters in Lille.  
Mobility scheme 2: transfer in the 2nd semester to Leipzig or Bologna with the possibility to possibility to change again afterwards.

In any case, at least 30 credit points must be earned per study location.

## **§ 10** **Modules of the Master's program**

The international master's program Advanced Spectroscopy in Chemistry comprises the modules presented in the appendix.

## **§ 11** **Completion of the Master's program**

The Master's program is completed with the Master's examination, which consists of module examinations during the course of study and the Master's thesis as well as the supervised internship with internship report.

## **§ 12** **Student Advisory Service**

- (1) General student advising is provided by the Central Student Advisory Service Office of the University of Leipzig. It covers questions about study opportunities, enrollment procedures and general students' matters.
- (2) Academic advising during the studies is provided by the respective advisors. It relates to questions of study organization.
- (3) Students should attend an advising session in their third semester if they have not earned any credit points by that time.

## **§ 13** **Effective date and release**

- (1) These amendment statutes to the examination regulations for the joint international and English-language Master's program with the designation Advanced Spectroscopy in Chemistry with the degree of Master of Science (M.Sc.) at the of Science (M.Sc.) at Leipzig University shall enter into force on April 1, 2023 and shall be and will be published in the Official Announcements of Leipzig University. It applies to all students enrolled in the joint international and English-language Master's program with the designation Advanced Spectroscopy in Chemistry with the degree of Master of Science (M.Sc.) at the Leipzig University.
- (2) It was adopted by the Faculty Council of the Faculty of Chemistry and Mineralogy on June 13, 2022. The study regulations were approved by the Rectorate on October 5, 2017. They are published in the Official Announcements of the University of Leipzig.

- (3) Academic work completed in accordance with previously valid regulations version, prior to the effective date of this revision will be recognized.

Leipzig,

Professor Dr. Inés Obergfell

Rector

Explanations of placeholders in the appendices to study regulations:

**General explanation**

Placeholder:

These are in the overview for selection options of the students. The scope of the modules to be selected (credit points) is indicated in each case.

Elective placeholders are to be filled from the attached catalog of elective modules in accordance with the requirements of the examination regulations.

**Individual Explanation**

Elective placeholders:

These placeholders stand for the elective modules of the program, which can be studied to the extent indicated therein. Which elective modules are to be selected is regulated in the examination regulations.



**Appendix to the study regulations of the Master of Science Advanced Spectroscopy in Chemistry program (as of WS 2017/18) Study plan/ Module overview table**

Module and corresponding classes with subject and type (scope of the courses)		semester	type	credits	CP	
<b>Elective course holder 1 (Modules with a scope of 30 CP according to § 25 Abs. 3 Nr. 1 Examination Regulations)</b>		1.	P	1	900	30
Prerequisites for participation:						
Offered in:		each winter semester				
<b>Elective course holder 2 (Modules with a scope of 45 CP according to § 25 Abs. 3 Nr. 3 Examination Regulations)</b>		2./3.	P	2	1350	45
Prerequisites for participation:						
Offered in:		each semester				
<b>Elective course holder 3 (Practical modules with a scope of 10 CP according to § 25 Abs. 3 Nr. 4 Examination Regulations)</b>		2./3.	P	1	300	10
Prerequisites for participation:						
Offered in:		each semester				
<b>13-122-0415 Synchrotron radiation and its applications</b>		2.	P	1	150	5
Lecture "Synchrotron radiation" (2SWS)						
Seminar "Synchrotron radiation" (1SWS)						
Prerequisites for participation:		none				
Offered in:		each summer semester				
<b>Master`s Thesis</b>				900	30	
<b>Sum:</b>				3600	120	

## Elective modules Master of Science Advanced Spectroscopy in Chemistry (from WS 2017/18)

Module and corresponding classes with subject and type (scope of the courses)		1st semester	2nd semester	3rd semester	4th semester	5th semester
<b>13-121-0641</b> <b>Computational Spectroscopy</b>		1./3.	WP	1	150	5
Lecture "Computational Spectroscopy" (2SWS)						
Practical exercises "Computational Spectroscopy" (3SWS)						
Prerequisites for participation:		none				
Offered in:		each winter semester				
<b>11-122-1121</b> <b>Receptor Biochemistry</b>		2.	WP	1	150	5
Lecture "Receptor Biochemistry" (2SWS)						
Seminar "Receptor Biochemistry" (2SWS)						
Prerequisites for participation:		Basic knowledge in biochemistry				
Offered in:		each summer semester				
<b>12-122-1511</b> <b>Basics of Interaction of Electromagnetic Radiation with Matter (Spectroscopy)</b>		2.	WP	1	150	5
Lecture "Basics of Interaction of Electromagnetic Radiation with Matter" (4SWS)						
Prerequisites for participation:		none				
Offered in:		each summer semester				
<b>13-121-0122</b> <b>Advanced Practical Course Molecular Spectroscopy</b>		2./3.	WP	1	300	10
Practical course "Molecular Spectroscopy" (10SWS)						
Prerequisites for participation:		Knowledge of the basics of magnetic resonance, the most important NMR methods and their application.				
Offered in:		each semester				
<b>13-121-0123</b> <b>Advanced Practical Course in Concentration Analysis</b>		2./3.	WP	1	300	10
Practical course "Concentration Analysis" (10SWS)						
Prerequisites for participation:		none, cannot be combined with 13-121-0121				
Offered in:		each semester				
<b>13-121-0126</b> <b>Advanced Practical Course in Trace Analysis</b>		2./3.	WP	1	300	10
Practical course "Trace Analysis" (10SWS)						
Prerequisites for participation:		none				
Offered in:		each semester				

13-121-0215 <b>Research Practical Course in Inorganic Chemistry</b>		2./3.	WP	1	300	10
Practical course "Inorganic Chemistry" (10SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				
13-121-0216 <b>Research Practical Course Organometallic Chemistry</b>		2./3.	WP	1	300	10
Practical course "Organometallic Chemistry" (10SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				
13-121-0217 <b>Research Practical Course in Inorganic Chemistry - Functional Materials</b>		2./3.	WP	1	300	10
Practical course "Functional Materials" (10SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				
13-121-0218 <b>Research Practical Course Supramolecular Coordination Chemistry</b>		2./3.	WP	1	300	10
Practical course "Supramolecular Coordination Chemistry" (10SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				
13-121-0313 <b>Laboratory Course in Advanced Synthetic Organic Chemistry</b>		2./3.	WP	1	300	10
Practical course "Advanced Synthetic Organic Chemistry" (10SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				
13-121-0314 <b>Practical course Chemistry of Natural Products</b>		2./3.	WP	1	300	10
Practical course "Chemistry of Natural Products" (10SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				
13-121-0315 <b>Laboratory Course Catalytic Methods in Organic Chemistry</b>		2./3.	WP	1	300	10
Practical course "Catalytic Methods in Organic Chemistry" (10SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				
13-121-0316 <b>Laboratory Course Organic Chemistry / Chemical Biology</b>		2./3.	WP	1	300	10
Practical course "Organic Chemistry/ Chemical Biology" (10SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				

13-121-0417 <b>Research Practical Course in Reaction Kinetics and Structure Elucidation</b>		2./3.	WP	1	300	10
Practical course "Reaction Kinetics and Structure Elucidation" (10SWS)						
Prerequisites for participation:		none				
Offered in:		each semester				
13-121-0418 <b>Research Practical Course in Thin Film Growth, Phenomena and Analysis of Solid Interfaces</b>		2./3.	WP	1	300	10
Practical course "Thin Film Growth, Phenomena and Analysis of Solid Interfaces" (10SWS)						
Prerequisites for participation:		none				
Offered in:		each semester				
13-121-0419 <b>Research Practical Course on the Characterization of Gas Phase Clusters and Liquid Interfaces</b>		2./3.	WP	1	300	10
Practical course "Characterization of Gas Phase Clusters and Liquid Interfaces" (10SWS)						
Prerequisites for participation:		none				
Offered in:		each semester				
13-121-0514 <b>Research Practical Course in Heterogeneous Catalysis</b>		2./3.	WP	1	300	10
Practical course "Heterogeneous Catalysis" (10SWS)						
Prerequisites for participation:		none				
Offered in:		each semester				
13-121-0515 <b>Research Practical Course Chemical Reaction Engineering</b>		2./3.	WP	1	300	10
Practical course "Chemical Reaction Engineering" (10SWS)						
Prerequisites for participation:		none				
Offered in:		each semester				
13-121-0631 <b>Practical Course Theoretical Chemistry</b>		2./3.	WP	1	300	10
Practical course "Theoretical Chemistry" (10SWS)						
Prerequisites for participation:		knowledge of modern methods of theoretical chemistry				
Offered in:		each semester				
13-121-0642 <b>Computational Chemistry of Solids</b>		2.	WP	1	150	5
Lecture "Computational Chemistry of Solids" (2SWS)						
Practical exercises "Computational Chemistry of Solids" (3SWS)						
Prerequisites for participation:		none				
Offered in:		each summer semester				
13-121-1114 <b>Practical Course Bioanalytics</b>		2./3.	WP	1	300	10
Practical course "Bioanalytics" (10SWS)						
Prerequisites for participation:		Participation in module 13-121-1119				
Offered in:		each semester				
13-121-1115 <b>Practical Course Recombinant Protein Expression</b>		2./3.	WP	1	300	10
Practical course "Recombinant Protein Expression" (10SWS)						

	Prerequisites for participation:	none							
	Offered in:	each semester							
13-121-1119	<b>Separation techniques and advanced "-omics"-techniques</b>		2.	WP	1	150	5		
	Lecture "Separation techniques and advanced "-omics"-techniques" (2SWS)								
	Seminar "Separation techniques and advanced "-omics"-techniques" (2SWS)								
	Prerequisites for participation:	Knowledge of mass spectrometric analytical methods							
	Offered in:	each summer semester							
13-121-1311	<b>Advanced Practical Course Crystallography in Materials Science</b>		2./3.	WP	1	300	10		
	Practical course "Crystallography in Materials Science" (10SWS)								
	Prerequisites for participation:	none							
	Offered in:	each semester							
13-121-1416	<b>Recent Trends in Chemistry</b>		2.	WP	2	150	5		
	Colloquium "Recent Trends in Chemistry" (3SWS)								
	Prerequisites for participation:	none							
	Offered in:	each semester							
13-121-1422	<b>Advanced Practical Course in Atmospheric Chemistry</b>		2./3.	WP	1	300	10		
	Practical course "Atmospheric Chemistry" (10SWS)								
	Prerequisites for participation:	none							
	Offered in:	each semester							
13-122-0122	<b>Selected Topics of NMR Spectroscopy</b>		2.	WP	1	150	5		
	Lecture "Selected Topics of NMR Spectroscopy" (2SWS)								
	Practical exercises "Selected Topics of NMR Spectroscopy" (1SWS)								
	Prerequisites for participation:	none							
	Offered in:	each summer semester							
13-122-0221	<b>Structural Analysis in Inorganic Chemistry</b>		2.	P	1	150	5		
	Lecture "Inorganic Structural Analysis" (4SWS)								
	Prerequisites for participation:	none							
	Offered in:	each summer semester							
13-122-0321	<b>Highlights in Natural Products Synthesis</b>		2.	WP	1	150	5		
	Lecture "Highlights in Natural Products Synthesis" (3SWS)								
	Seminar "Highlights in Natural Products Synthesis" (1SWS)								
	Prerequisites for participation:	none							
	Offered in:	each summer semester							
13-122-0411	<b>Short pulse and surface spectroscopy</b>		2.	WP	1	150	5		
	Lecture "Short pulse and surface spectroscopy" (3SWS)								
	Prerequisites for participation:	none							
	Offered in:	each summer semester							
13-122-0521	<b>Modern Concepts in Catalysis</b>		2.	WP	1	150	5		
	Lecture "Heterogeneous Catalysis" (2SWS)								

Seminar "Modern Concepts in Catalysis " (2SWS)						
Prerequisites for participation:	none					
Offered in:	each summer semester					
<b>11-121-1112</b> <b>Bioorganic Chemistry</b>		3.	WP	1	150	5
Lecture "Bioorganic Chemistry" (2SWS)						
Seminar "Bioorganic Chemistry" (2SWS)						
Prerequisites for participation:	Participation in the module " Basics of Biochemistry" (11-111-1152-N) or equivalent knowledge.					
Offered in:	each winter semester					
<b>11-121-1116</b> <b>Practical Course Bioorganic Chemistry</b>		3.	WP	1	300	10
Practical course "Bioorganic Chemistry" (10SWS)						
Prerequisites for participation:	Participation in the module "Bioorganic Chemistry" (11-121-1112)					
Offered in:	each semester					
<b>13-121-0125</b> <b>Methods and Procedures for Trace Analysis</b>		3.	WP	1	150	5
Lecture "Methods and Procedures for Trace Analysis" (2SWS)						
Training "Methods and Procedures for Trace Analysis" (1SWS)						
Exercises "Methods and Procedures for Trace Analysis" (1SWS)						
Prerequisites for participation:	none					
Offered in:	each winter semester					
<b>13-121-0420</b> <b>Physical Chemistry of Clusters</b>		3.	WP	1	150	5
Lecture "Physical Chemistry of Clusters" (3SWS)						
Prerequisites for participation:	none					
Offered in:	each winter semester					
<b>13-121-1120</b> <b>Protein Crystallography</b>		3.	WP	1	150	5
Lecture "Protein Crystallography" (2SWS)						
Practical course "Protein Crystallography" (2SWS)						
Prerequisites for participation:	none					
Offered in:	each winter semester					
<b>13-121-1415</b> <b>Practical Course in Environmental Chemistry</b>		3.	WP	1	300	10
Practical course "Environmental Chemistry" (10SWS)						
Prerequisites for participation:	none					
Offered in:	each semester					
<b>13-122-0121</b> <b>NMR on Biosystems</b>		3.	WP	1	150	5
Lecture "NMR on Biosystems" (2SWS)						
Seminar "NMR on Biosystems" (1SWS)						
Exercises "NMR on Biosystems" (1SWS)						
Prerequisites for participation:	none					
Offered in:	each winter semester					
<b>13-122-0413</b> <b>Surface Analysis of Solids</b>		3.	WP	1	150	5
Lecture "Surface Analysis of Solids" (3SWS)						
Prerequisites for participation:	none					

	Offered in:	alternating every 2 years in the winter semester				
13-122-0511		3.	WP	1	150	5
<b>Nanostructured Catalytic Systems</b>						
Lecture "Nanostructured Catalytic Systems" (2SWS)						
Exercise "Nanostructured Catalytic Systems" (2SWS)						
	Prerequisites for participation:	none				
	Offered in:	each winter semester				
13-122-0512		3.	WP	1	150	5
<b>Sustainable Systems in Chemistry</b>						
Lecture "Sustainable Systems in Chemistry" (3SWS)						
Seminar "Sustainable Systems in Chemistry" (1SWS)						
	Prerequisites for participation:	none				
	Offered in:	each winter semester				
13-121-0424		2./3	WP	1	150	10
<b>Research Practical Course on the chemistry of molecular fragment ions and ion soft-landing</b>						
Practical course "Chemistry of molecular fragment ions and ion soft-landing" (10 SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				
13-121-0632		2./3	WP	1	150	10
<b>Research Practical Course Artificial Intelligence in Theoretical Chemistry</b>						
Practical course "Research Practical Course Artificial Intelligence in Theoretical Chemistry" (10 SWS)						
	Prerequisites for participation:	none				
	Offered in:	each semester				