

The English version of the curriculum for the „Doctoral Programme Chemistry“ is not legally binding and is for informational purposes only. The legal basis is regulated in the curriculum published in the University of Innsbruck Bulletin on 20 February 2009, issue 27, No. 149.

Decision of the Curriculum Committee of the Faculty of Chemistry and Pharmacy on 22 January 2009, approved by Senate Decree on 5 February 2009:

On the basis of § 25 para. 1 no. 10 University Organisation Act 2002, BGBl. I (Federal Law Gazette) No. 120, most recently amended by Federal Law BGBl. I (Federal Law Gazette) No. 134/2008 and § 32 Section "Regulations of Study Law", republished in the University of Innsbruck Bulletin of 3 February 2006, Issue 16, No. 90, most recently amended by the University of Innsbruck Bulletin of 7 May 2008, Issue 42, No. 272, the following is decreed:

Curriculum for the **Doctoral Programme Chemistry** at the Faculty of Chemistry and Pharmacy of the University of Innsbruck

§ 1 Qualification Profile and Study Objectives

- (1) The Doctoral Programme Chemistry belongs to the group of studies in the natural sciences.
- (2) Graduates of the Doctoral Programme Chemistry have a systematic understanding of their research discipline and command the methods employed by research in this field. Through their submission of an original piece of scientific work, graduates have made their own contribution to research which widens boundaries of knowledge and conforms to the evaluation standards of international experts. The quality and international orientation of the studies promote the graduates' mobility and sharpen their perception beyond the boundaries of their special field. The key qualifications acquired qualify the graduates to adapt their expertise to fast-changing requirements.
- (3) The Doctoral Programme Chemistry at the University of Innsbruck serves to educate and train junior scientists in the field of chemistry and its related disciplines.
- (4) Graduates of the doctoral programme are able to independently elaborate and present issues in the natural sciences on a very high level of subject-related and methodical expertise. Additionally, students acquire general scientific and communicative competences required from successful professional scientists in leading positions in an academic, industrial, or public environment. In particular, this includes the following fields of knowledge and skills:

Knowledge and understanding:

- in-depth knowledge of the natural-science disciplines relevant for the dissertation topic, particularly in the core areas of chemistry and its related disciplines; this includes the most important strategies and methods of modern research in chemistry;

- detailed knowledge required for successful work on the dissertation, particularly in the core subjects of chemistry and its related disciplines; this includes the current literature relevant for successful work on the dissertation.

Practical skills:

- skills to plan, practically carry out, select methods for, and interpret natural-science approaches for working on the dissertation topic;
- skills to deepen and widen one's practical experience and knowledge of pertinent methods in the special subject field of the dissertation;
- skills to research and critically interpret scientific literature and other information, including the use of data bases relevant in the field.

Communicative skills:

- skills to present and explain the scientific results of one's own research;
- skills to critically assess one's own research results and those of others in relation to the international state of knowledge in terms of natural science facts, concepts, and theories;
- skills to communicate with chemists, natural scientists, or a general public consisting of interested laypeople to explain, discuss critically, and present effectively scientific results and subject matter;

Competences for the profession as a scientist:

- understanding career requirements of independent scientists in academic, industrial or public environments;
- understanding quality controls in laboratories, international quality standards (e.g. good scientific practice) and pertinent legal standards;
- competence to write scientific publications according to the formal, ethical, and qualitative standards of international publications;
- knowledge of pertinent national and international research funding organizations;
- understanding ethically relevant issues (e.g. methods of data collection, plagiarism, co-authorship) in scientific practice and knowledge of pertinent basic standards and problem solutions.

§ 2 Length and scope

The Doctoral Programme Chemistry takes three years (six semesters), which equals 180 ECTS credits.

§ 3 Admission

- (1) Valid proof of the necessary academic level for admission to the Doctoral Programme Chemistry must be provided. This includes proof of completion of relevant diploma or master programmes, of completion of relevant diploma or Magister programmes at a university of applied science or completion of other equivalent studies at an accredited Austrian or non-Austrian post-secondary educational institution. If equivalency is given in principle, and only a few elements are missing for full equivalency, the rector's office is entitled to combine the determination of equivalency

with the obligation to pass certain examinations in the course of the Doctoral Programme Chemistry.

- (2) Relevant studies include, in any case, the completed Diploma Programme Chemistry, the Academic Teacher Training Programme Chemistry with Diploma Thesis for the School Subject Chemistry, the Master Programme Chemistry, as well as the Master Programme Materials Sciences and Nanosciences at the University of Innsbruck.

§ 4 Types of courses and maximum number of students per course

- (1) **Lecture (VO):** A lecture serves to convey concepts, a survey of the field, specialized knowledge, and current developments in the respective subject. Maximum number of participants: 60
- (2) **Seminar (SE):** Seminars are courses with continuous performance assessment where students prepare and present their own content in a subject-specific way. Seminars focus on the scientific presentation as well as subject-specific discussion of and critical reflection on the current state of knowledge. Seminars also train interdisciplinary communication skills and presentation techniques. In seminars, performance is evaluated by the instructors who take into consideration both the subject-specific and methodical value of the results as well as the quality of presentations and discussions. Maximum number of participants: 30
- (3) **Special course (KU):** A special course is a course with continuous performance assessment which trains subject-specific competences and requires active student participation. Maximum number of participants: 60

§ 5 Procedure for the allotment of places in courses with a limited number of participants

Students whose study time will be prolonged if they are not admitted are to be given priority.

§ 6 Modules

- (1) The following modules - equal to 60 ECTS credits – are mandatory:

1	Mandatory Module: Scientific Basics/Core Skills of the Thesis Topic	Sem. hours	ECTS credits
	Courses, as defined in the dissertation agreement, equal to 10 ECTS credits must be completed to develop the scientific basis/core competences for the dissertation topic.		10
	Total		10
	Learning objectives of the module: After the successful completion of this module, students possess the high level of interdisciplinary knowledge necessary for working on the dissertation.		
	Admission requirements: as defined in the respective curricula		

2	Mandatory Module: Tutelage of Scientific Working	Sem. hours	ECTS credits
a	Discussion and critical analysis of the student's	-	15

	experimental data; conceptual support of the dissertation in the course of the six-semester doctoral programme (6 x 2.5 ECTS credits)		
b	Conceptual design of the dissertation paper	-	2.5
	Total	-	17.5
<p>Learning objectives of the module: After the successful completion of this module, students can analyze and critically interpret the data they have collected according to the current state of knowledge in the dissertation field; as a result, they are able to formulate their own research strategies. Students are in a position to document and analyze scientific data according to pertinent quality standards.</p>			
Admission requirements: none			

3	Mandatory Module: Department Seminar	Sem. hours	ECTS credits
	Mandatory participation in six special seminars in the subject-specific field of the dissertation as defined in the dissertation agreement; subject-specific fields are: analytical chemistry, inorganic chemistry, biochemistry, organic chemistry, physical chemistry, textile chemistry, and theoretical chemistry.		
	SE Special Seminar I	2	1.5
	SE Special Seminar II	2	1.5
	SE Special Seminar III	2	1.5
	SE Special Seminar IV	2	1.5
	SE Special Seminar V	2	1.5
	SE Special Seminar VI	2	1.5
	Total	12	9
<p>Learning objectives of the module: Having successfully completed this module, students are able to actively participate in the discussion of the current state of knowledge in the area of the dissertation topic and can critically reflect on and discuss issues with experts in the chosen special discipline of chemistry.</p>			
Admission requirements: none			

4	Mandatory Module: Lecture Series Austrian Chemical Society / Center for Molecular Biosciences Innsbruck / Materials and Nano-Sciences / High Performance Computing	Sem. hours	ECTS credits
	KU Lecture series Mandatory participation in a total of 15 lectures of the Gesellschaft Österreichischer Chemiker (Austrian Society of Chemists; GÖCh) and/or of the Center for Molecular Biosciences Innsbruck (CMBI) and/or of the Research Center for Material and Nanosciences and/or of the High Performance Computing (HPC) Research Center	2	2.5
	Total	2	2.5
<p>Learning objectives of the module: By participating in the lectures, students become familiar with current research topics of selected experts and experience how current issues are presented and discussed on a scientific level. Through their contact with</p>			

	guest professors, students become acquainted with the scientific community.
	Admission requirements: none

5	Mandatory Module: Presentation of Own Research Results	Sem. hours	ECTS credits
	Presentation of the student's research results in the form of annual progress reports (3 x 2 ECTS credits), poster presentations and/or presentations at national and international conferences (2 x 2.5 credits)	-	11
	Total	-	11
	Learning objectives of the module: Upon completion of this module, students are able to independently prepare, design, and give scientific presentations or poster presentations; they are able to critically discuss and reflect on questions with experts.		
	Admission requirements: none		

6	Mandatory Module: Generic Skills	Sem. hours	ECTS credits
	Selection of suitable courses equal to 5 ECTS credits whose learning objectives include general, subject-specific competences. One course can be chosen from the field of "Equality".	-	5
	Total	-	5
	Learning objectives of the module: After the successful completion of this module, students possess subject-specific and interdisciplinary competences relevant for a successful career as an independent scientist in an academic, industrial or public environment		
	Admission requirements: none		

7	Mandatory Module: Doctoral Thesis Defense	Sem. hours	ECTS credits
	Final oral dissertation defense before an examination board	-	5
	Total	-	5
	Learning objectives of the module: Presentation, reflection on, and analysis of the dissertation results in the overall context of the doctoral study programme; the focus is on summarizing and explaining results of the research project, on presenting the increase in knowledge for the discipline, and on demonstrating evaluation and method competences as well as presenting the results.		
	Admission requirements: positive completion of all other modules and positive evaluation of the dissertation		

§ 7 Dissertation

- (1) In the course of the Doctoral Programme Chemistry, a dissertation has to be written, which equals 120 ECTS credits. The dissertation is a piece of scientific work on a very high level which – in contrast to a diploma or master thesis – serves to prove the student's ability to cope with scientific questions in an independent way.
- (2) The dissertation topic has to be chosen from the field of chemistry or has to show a close thematic relationship to chemistry.
- (3) The student has to propose a team of supervisors, consisting of at least two people (dissertation committee) and to nominate one of them as the supervisor mainly responsible. It is permissible to propose supervisors (with the exception of the main supervisor) from subject-related fields. In justifiable exceptional cases it is possible for students to propose only one supervisor.
- (4) Prior to beginning the work, the student has to communicate the dissertation topic and the names of the supervisors to the Director of Studies in writing. Topic and supervisors are considered as accepted, if the Director of Studies does not veto them by means of a decree within one month after the receipt of the proposal.
- (5) The dissertation can also consist of articles that are related in terms of subject matter or methods. In this case, a minimum of three publications in international journals must be submitted where the student is the first author; the publications must either have been published or at least been accepted for publication. If the articles were written by several authors, the student's own contribution must be clearly shown and must be added to the dissertation. Additionally, the student has to write an extensive summary of the subject area, the methods employed, and the results he/she has obtained. In doing so, the student must refer to the articles already published and included in the dissertation. Furthermore, the scientific work has to be summarized and reflected on intensively, taking into consideration the current state of research in the area of the dissertation; also, a preview has to be given of the future scientific and methodical development of the elaborated topic.

§ 8 Examination regulations

- (1) The evaluation of Modules 1 and 6 is based on course examinations.
 - 1 Lectures are evaluated by means of a single exam at the end of the course. The lecturer is required to communicate evaluation methods and criteria (oral and/or written) before the course starts.
 - 2 The evaluation of courses with continuous performance assessment is based on the student's regular, written and/or oral and/or practical/experimental contributions. The lecturer is required to communicate evaluation methods and criteria before the course starts.
- (2) Modules 2, 3, 4, and 5 are evaluated by the main supervisor on the basis of a performance report created by the student. A positive grade has to read "participated with success"; a negative grade has to read "participated without success".

(3) The evaluation of the Mandatory Module "Dissertation Defense (final oral exam)" is based on an oral exam taken before an examination board consisting of at least three examiners.

§ 9 Academic degree

Graduates of the Doctoral Programme Chemistry are awarded the academic degree of "Doctor of the Natural Sciences" or "Doctor rerum naturalium" in Latin, or "Dr. rer. nat.", in brief.

§ 10 Implementation

This curriculum comes into force on 1 October 2009.

For the Curriculum Committee:
Ao. Univ.-Prof. Dr. Benno Bildstein

For the Senate:
Univ.-Prof. Dr. Ivo Hajnal