Discipline-Specific Regulations for Study and Examinations for the Master's Program in Toxicology at the University of Potsdam

As of January 20, 2016

The Faculty Committee of the Faculty of Science at the University of Potsdam has approved on January 20, 2016, the following degree and examination regulations on the basis of Article 19 Para 1, Article 22 Para 1, Article 22 Para 1-3, and Article 31 in combination with Article 72 Para 2 (1) of the Brandenburg Higher Education Act (BbgHG) of April 28, 2014 (Law and Ordinance Gazette [GVBl.] I/14, [no. 18]), last amended by Article 2 of the Act of July 1, 2015 (Law and Ordinance Gazette [GVBl.] I/15 [no. 18]) in combination with the Ordinance on the Design of Examination Regulations to Guarantee the Equivalency of Studies, Examinations, and Degrees (University Examination Ordinance - HSPV) of March 4, 2015 (GVBl. II/15 [no. 12]), and with Article 14 Para 1 (2) of the Basic Constitution of the University of Potsdam dated December 17, 2009 (Bulletin UP no. 4/2010, p. 60) in the third amended version of the Basic Constitution of the University of Potsdam (GrundO) of May 21, 2014 (Bulletin UP no. 6/2015, p. 235) and Article 1 Para 2 of the new version of the general study and examination regulations for Master's programs at the University of Potsdam not related to teacher education of January 30, 2013 (BAMA-O) (Bulletin UP no. 3/2013, p. 35), last amended on February 26, 2014 (May 21, 2014 Bulletin UP 3/2014, p. 35):[1]

Table of Contents

[1] Approved by the President of the University of Potsdam on Xxxxx XX, 2016.

§ 1 Applicability

(1) These regulations apply to the Master's program in Toxicology at the University of Potsdam. These discipline-specific regulations supplement the new version of the General Regulations for Study and Examinations for Bachelor's and Master's Degrees (not for teachers in training) at the University of Potsdam (BAMA-O).

(2) In the event that these regulations contradict the BAMA-O, then the provisions in the BAMA-O supersede these regulations.

§ 2 Degree

The Faculty of Science at the University of Potsdam awards the degree of "Master of Science" (M.Sc.) to students who have completed the necessary credit points and graduation requirements.

§ 3 Objectives of Master's Program

(1) The objective of this research-oriented Master's program is to enable students to perform autonomous scientific activities worldwide in toxicological research and risk assessment at university-based and extramural research institutions, in the chemical and pharmaceutical industries, and at government agencies.

(2) The students:
• Have profound knowledge in the central areas of toxicology.
• Understand the molecular interactions between toxic substances and biological target structures.
• Have very good practical skills in the fields of instrumental analysis, in-vitro toxicology, and laboratory animal science.
• Are familiar with the national and international structures of legislation and regulation in the fields of chemical safety and drug approval.
• Can interpret new research in a team or independently, critically discuss it, present it to other scientists or a popular-scientific audience, and apply it to solving their own questions.
• Are furthermore capable of planning, executing, and directing toxicological projects.

(3) The program gives students broad-based, comprehensive scientific training in the discipline of toxicology while enabling very personalized disciplinary positioning in specific toxicology subfields through a specialization module, advanced research internships, and the subsequent Master's thesis. Thus this Master's program is suitable for both students who would like a broad toxicology educa-

tion and those who aspire to a more in-depth specialization.

(4) The option to complete advanced research internships and Master's theses at government agencies, in industry, abroad, or at research institutes gives students the opportunity to try out possible future career paths individually.

(5) The Master's examination will determine whether the students have acquired the skills required for application in occupational practice as well as in research and teaching.

§ 4 Admission Prerequisites; Application Periods and Documents

(1) The following special admission prerequisites apply to the Master's program in Toxicology:

(a) An undergraduate academic degree in chemistry, biochemistry, food chemistry, nutritional science, biology, pharmacy, medicine, or veterinary medicine; the scope of the degree must at minimum equate to a 180-CP (credit points) Bachelor's degree; academic degrees in related fields may be recognized provided they are equivalent or comparable.

(b) A share of classes in science or medicine relevant to the Toxicology Master's program comprising at least 60 credit points (CP).

(c) Proof of English-language skills that correspond at least to Level C1 of the European Framework for Languages. Article 4 Para 2 of ZulO governs the specifics. The Examining Board issues decisions regarding credentials on a case-by-case basis.

(2) In a deviation from Article 4 Para 4 of ZulO, German language skills are not required.

(3) The application for the Master's program in Toxicology, when matriculating as of the first semester, can only begin in the winter semester. The application for the Master's program in Toxicology, when matriculating as of a later semester, can begin in either the winter or summer semester.

(4) Apart from those application materials listed in Article 5 Para 3 of ZulO, the following application materials shall be submitted:
- Proof of the requisite language skills (Para 1 and 2 in connection with Article 4 of the admission regulations [ZulO])
- Proof of a degree in an appropriate subject/degree program
- Proof of credit points in accordance with Para 1 (b)

§ 5 Cooperation with Institutions outside the University of Potsdam

(1) The Master's program in Toxicology is conducted in cooperation with the German Institute of Human Nutrition (DIfE), the Federal Institute for Risk Assessment (BfR), and other institutions authorized by the Examining Board. In the case of the DIfE, this collaboration is reflected in joint appointments by the University of Potsdam and the DIfE. The jointly appointed professors and research assistants of the DIfE give mandatory and elective classes for the Master's program, drawing on the expertise present at the Institute.

(2) A collaboration with medical institutions to impart clinical learning material is necessary. Furthermore, a collaboration with clinical institutions may lead to adding electives to the curriculum. The Examining Board shall authorize members of these institutions to teach classes by agreement with the institution's board. The Examining Board shall decide on a case-by-case basis whether to count practical activities at other institutions toward the degree and, if so, how to evaluate them.

§ 6 Duration and Organization of Master's Program

The consecutive Master's program in Toxicology is offered at the University of Potsdam as a single-discipline program with a standard period of study (full-time program) of 4 semesters and 120 credit points (CP).

§ 7 Part-Time Program

The Master's program in Toxicology is suitable as a part-time program. Part-time study requires advising from the relevant faculty so that an individualized plan of study can be created. Proof of this advising must be attached to an application in accordance with Article 3 of the Regulations for Part-Time Studies at the University of Potsdam (Part-Time Regulations). The provisions of the Part-Time Regulations also apply.

§ 8 Modules and the Course of Study

(1) The Master's program in Toxicology is comprised of the following components:

Master's studies		
Module number	**Name of module**	**CP**
I Mandatory modules (*75 CP*)		
IEW-M1.1	Principles in	12

	Toxicology	
IEW-M1.2	Pharmacology, Physiology and Pathophysiology	6
IEW-M1.3	Tissue-Specific Toxicity and Histopathology	6
IEW-M1.4	Principles in Experimental Animal Toxicity Testing	6
IEW-M2.1	Advanced Toxicology	9
IEW-M2.2	Experimental Toxicology	15
IEW-M2.3	Human Toxicology	6
IEW-M3.1	Applied Toxicology, Regulatory Toxicology and Risk Assessment	15
II Elective modules (15 CP)		
An elective module worth 15 credit points must be successfully completed.		
IEW-M3.2	Practical Toxicology - Industry	15
IEW-M3.3	Practical Toxicology - Authorities	15
IEW-M3.4	Practical Toxicology - Applied Research	15
Total CP for mandatory and elective modules to be completed		*90*
III Master's thesis		30

(2) The language of instruction in the Master's program in Toxicology is English. All modules are offered in English.

(3) The descriptions of the modules named in Para 1 are given in the Module Catalog in Appendix 1 of these regulations.

(4) A sample course of study for the Master's degree is provided in Appendix 2 of these regulations.

§ 9 Stay Abroad

If a stay abroad is intended during the Master's program, the third or fourth semester according to the sample course of study are recommended.

§ 10 Passes

In the Master's program in Toxicology, students have two passes as defined in Article 13 of BAMA-O. These are restricted to the modules from M1.1 to M2.3.

§ 11 Weighting of Modules for Grading Purposes

In a deviation from Article 31 Para 1 (1) of BAMA-O, the modules are weighted as follows in order to determine the overall grade for the Master's program:

Name of module	Weight
From M 1.1 to M3.4	*1x*
Master's thesis	*3x*

§ 12 Master's Thesis

(1) The Master's thesis, including the oral defense, is equivalent to 30 credit points.

(2) As soon as the student has completed 75 credit points, he or she must immediately propose a topic for his/her Master's thesis.

(3) The Master's thesis is generally an experimental final thesis. Upon submission of a letter of application to the Examining Board, other types of non-experimental theses may be approved, provided they are of an equivalent scope and scientific level as an experimental thesis. A pure literature review does not satisfy this requirement. The students shall demonstrate that they are able to work autonomously on an assignment, typically experimental, in a subfield of toxicology by the specified deadline and show they can represent their findings and a critical discussion in written and oral form as a presentation.

(4) Upon submission of a letter of application to the Examining Board, the Master's thesis project may also be performed at an industrial enterprise, a government agency, or a scientific institution in Germany or abroad, provided that the work is demonstrably related to the central content of the program. In such cases, an authorized instructor of the Toxicology Master's program must take on the role of supervisor. The Examining Board will decide upon the application.

(5) In a deviation from Article 30 Para 12 of BAMA-O, the Master's thesis is to be written in English.

§ 13 Application

(1) Article 4 of these regulations takes effect on April 1, 2016. All remaining provisions take effect *on October 1, 2016*.

(2) These regulations apply to all students who enroll in the Master's program in Toxicology at the University of Potsdam after these regulations go into effect.

Appendix 1: Module catalog

The descriptions of the program's modules listed in Article 6 Para 1 and the tables below are governed by the statutes of the module catalog of the Faculty of Science as a supplement to the Bachelor's and Master's programs at the University of Potsdam (MK MNF). Supplementary regulations and/or deviations from the MK MNF are indicated in the tables that follow.

Module number:	Module name:	Mand./ Elec.	CP	Prerequisite for taking the module:
IEW-M1.1	Principles in Toxicology	Mand.	12	
IEW-M1.2	Pharmacology, Physiology and Pathophysiology	Mand.	6	
IEW-M1.3	Tissue-Specific Toxicity and Histopathology	Mand.	6	
IEW-M1.4	Principles in experimental animal toxicity testing	Mand.	6	
IEW-M2.1	Advanced Toxicology	Mand.	9	Successful completion of M1.1
IEW-M2.2	Experimental Toxicology	Mand.	15	Successful completion of M1.1
IEW-M2.3	Human Toxicology	Mand.	6	Successful completion of M1.1
IEW-M3.1	Applied Toxicology, Regulatory Toxicology and Risk Assessment	Mand.	15	Successful completion of M1.1, M1.2, M1.3, M1.4
IEW-M3.2	Practical Toxicology - Industry	Elec.	15	Successful completion of M1.1, M1.2, M1.3, M1.4
IEW-M3.3	Practical Toxicology - Authorities	Elec.	15	Successful completion of M1.1, M1.2, M1.3, M1.4
IEW-M3.4	Practical Toxicology - Applied Research	Elec.	15	Successful completion of M1.1, M1.2, M1.3, M1.4

CP = Number of credit points; Mand. = Mandatory module; Elec. = Elective module

READING VERSION OF MODULE DESCRIPTIONS
The module descriptions are not part of the Regulations; they are integrated into the First Amendment to the Module Catalog.

IEW-M1.1 Principles in Toxicology	Number of credit points (CP): 12
Module type (mandatory or elective):	Listed in the respective discipline-specific Regulations for Study and Examinations.
Content and objective of module:	

Contents:
- Introduction to general toxicology
- Foundations of toxicokinetics (ADME: absorption, distribution, metabolism, and excretion)
- Foundations of toxicodynamics
- Interactions between toxicokinetics and toxicodynamics
- Foundations of statistics, biometry, and epidemiology
- Toxicological effects: classification, limits, examples

Objectives:
- The module teaches a foundational understanding of the profiles of substances' toxic effects, incorporating toxicokinetics and toxicodynamics, including practical procedures for their determination. This requires working in small groups due to regulations on workplace safety/dangerous substances.
- The students obtain foundational insights into statistics and biometry and their application. The students are also capable of employing basic concepts in epidemiology and can apply them to toxicological issues.
- The students can scientifically process and present foundational questions in the fields of toxicokinetics, toxicodynamics, toxicological effects, and epidemiology, drawing on academic literature and working in teams (2–3 students).

Module (partial) exam(s) (number, form, scope):	Oral exam, 20 min
Independent study time (in hours):	265 hr

Courses (type of teaching)	Contact time (in semester hours)	Supplementary exam work (Number, form, scope)		Module (partial) exam (Number, form, scope)
		For completing the module	For admission to the module exam	
"Foundations of Toxicology" lecture	2			-
Research internship (2 weeks)	Supervision: 20 hr		Log, approx. 30 pp.	-
"Statistics, Biometry, Epidemiology" lecture	2			-
Seminar	1		Presentation, 20 min	-

Offered:	Winter semester
Prerequisite for taking the module:	-
Teaching unit(s):	Nutritional Science

IEW-M1.2 Pharmacology, Physiology and Pathophysiology	Number of credit points (CP): 6
Module type (mandatory or elective):	Listed in the respective discipline-specific Regulations for Study and Examinations.
Content and objective of module:	

Contents:
- Foundations of drug action (dose-response relationship, drug elimination)
- Introduction to major drug groups including mechanisms of action
- Foundations of physiology and pathophysiology
- Specific physiology and pathophysiology of nutrition, especially in connection with metabolism

Objectives:
The students have foundational knowledge of the major drug groups, particularly their pharmacokinetics, mechanisms of action, and unintended effects.
The students are familiar with the interactions between physiology and nutritional pathophysiology and their significance for nutrition-based illnesses.
The students possess advanced knowledge of metabolism and the significance of its malfunction for the development of obesity.

Module (partial) exam(s) (number, form, scope):	Written exam (90 min)
Independent study time (in hours):	120 hr

Courses (type of teaching)	Contact time (in semester hours)	Supplementary exam work (Number, form, scope)		Module partial exam (Number, form, scope)
		For completing the module	For admission to the module exam	
"Foundations of Pharmacology" lecture	2			-
"Physiology and Pathophysiology of Nutrition" lecture	2			-

Offered:	Winter semester
Prerequisite for taking the module:	
Teaching unit(s):	Nutritional Science in collaboration with DIfE

IEW-M1.3 Tissue-Specific Toxicity and Histopathology	Number of credit points (CP): 6
Module type (mandatory or elective):	Listed in the respective discipline-specific Regulations for Study and Examinations.
Content and objective of module:	

Contents:

- Characteristic organ-specific patterns of damage, examples of toxic effects, methods of investigation
  Organs: particularly the liver, lungs, kidneys and urinary system, blood and circulatory system, hematopoietic system, nervous system, gastrointestinal tract; brief introduction to the heart, eye, endocrine system, skin, ear
- Foundations of immunotoxicology
- Foundations of microscopy and histopathology

Objectives:

- The students are familiar with the clinical and morphological picture of major forms of organ damage and possess foundational knowledge of the underlying mechanisms of action.
- The students have foundational knowledge of the immune system and the pathomechanisms of various immunomodulating substances.
- The students can assess selected histological sections and can recognize and classify pathological changes in tissues.

Module (partial) exam(s) (number, form, scope):	Written exam (90 min)
Independent study time (in hours):	120 hr

Courses (type of teaching)	Contact time (in semester hours)	Supplementary exam work (Number, form, scope)		Module partial exam (Number, form, scope)
		For completing the module	For admission to the module exam	
"Organ Toxicology, Pathological Anatomy, and Histopathology" lecture	2			-
"Microscopy and Histopathology" lab course (one week)	Supervision: 12 hr	Log, 20 pp.		-

Offered:	Winter semester
Prerequisite for taking the module:	
Teaching unit(s):	Nutritional Science in collaboration with DIfE

IEW-M1.4 Principles in Experimental Animal Toxicity Testing				Number of credit points (CP): 6
Module type (mandatory or elective):		Listed in the respective discipline-specific Regulations for Study and Examinations.		
Content and objective of module:				
Contents: • Species-appropriate care, treatment and breeding of laboratory animals • Animal protection regulations and ethics • Anatomy, physiology, and pathology of the major laboratory animal species • Spontaneous illnesses, artificial illnesses • Transgenic animal models in toxicological research • Experiment planning and preparation, record-keeping, application forms, pain elimination and restriction of suffering, laboratory animal anesthesia, foundations of surgical work. **Objectives:** • The students are familiar with the legal foundations of animal protection and laboratory animal science and can implement it on a practical level.				
Module (partial) exam(s) (number, form, scope):		Written exam (90 min)		
Independent study time (in hours):		120 hr		
Courses (type of teaching)	Contact time (in semester hours)	Supplementary exam work (Number, form, scope)		Module partial exam (Number, form, scope)
		For completing the module	For admission to the module exam	
"Laboratory Animal Science" lecture	2			-
"Laboratory Animal Science, FELASA certificate" lab course (2 weeks)	Supervision: 30 hr			-
Offered:		Winter semester		
Prerequisite for taking the module:				
Teaching unit(s):		DIfE together with Nutritional Science		

IEW-M2.1 Advanced Toxicology	Number of credit points (CP): 9
Module type (mandatory or elective):	Listed in the respective discipline-specific Regulations for Study and Examinations.
Content and objective of module:	

Contents:

- Molecular cell toxicology
- Chemical mutagenesis and carcinogenesis
- Foundations of the toxicology of reproduction
- Food toxicology
- Introduction to nanotoxicology and eco-toxicology
- The seminar's purpose is to delve more deeply into the content covered in the lecture. To that end, the students give presentations on selected current questions in toxicology.

Objectives:

- The students are familiar with the basic mechanisms of toxic substances' cytotoxic effects, including how to provide evidence of them.
- The students have profound knowledge of chemical mutagenesis and carcinogenesis as well as non-genotoxic mechanisms of carcinogenesis.
- The students have learned the foundations of the male and female reproductive systems as well as methods for assessing changes based on relevant groups of substances.
- The students are familiar with groups of substances relevant to nutritional toxicology, including their mechanisms of action and toxicological classifications.
- The students possess basic knowledge of nano- and eco-toxicology.
- The students can work autonomously and theoretically on a specific toxicological question, drawing on primary sources, and give a presentation on it.

Module (partial) exam(s) (number, form, scope):	Oral exam, 30 min
Independent study time (in hours):	180 hr

Courses (type of teaching)	Contact time (in semester hours)	Supplementary exam work (Number, form, scope)		Module partial exam (Number, form, scope)
		For completing the module	For admission to the module exam	
"Special Topics in Toxicology" lecture	4			-
Seminar	1	Presentation, 30 min		-

Offered:	Summer semester
Prerequisite for taking the module:	Successful completion of M1.1
Teaching unit(s):	Nutritional Science

IEW-M2.2 Experimental Toxicology	Number of credit points (CP): 15
Module type (mandatory or elective):	Listed in the respective discipline-specific Regulations for Study and Examinations.
Content and objective of module:	

Contents:

- Introduction to the topics of testing strategies (including OECD testing procedures)
- Standard testing procedures for pharmaceuticals, pesticides, food additives, and other chemical substances
- Testing for acute and chronic toxicity, foundational aspects
- Specialized testing, in particular testing for genotoxicity, mutagenicity, carcinogenicity, neurotoxicity, and reproductive toxicity
- The need for targeted investigations into organ toxicity
- The value and execution of *in vitro* tests
- Alternatives to animal experiments, including *in vivo* model organisms (*Drosophila*, *C. elegans*, zebra fish), 3R principle
- Modeling, *in silico* methods in toxicology
- Introduction to instrumental analysis: chromatographic techniques, mass spectrometry, spectroscopy
- Molecular biological techniques and "omics" technologies

Objectives:

- The students possess profound theoretical knowledge of toxicological testing strategies and the 3R principle.
- The students have the skills to plan, conduct, and assess toxicological studies for substance approval.
- The students are familiar with instrumental/analytical techniques and can assess data's accuracy and meaningfulness.
- The students possess profound practical knowledge of *in vitro* testing, including the end points of cytotoxicity, genotoxicity, mutagenicity, and toxicokinetics.
- The students possess foundational practical knowledge for working with *in vivo* modeling systems.

Module (partial) exam(s) (number, form, scope):	Oral exam, 30 min
Independent study time (in hours):	270 hr

Courses (type of teaching)	Contact time (in semester hours)	Supplementary exam work (Number, form, scope)		Module partial exam (Number, form, scope)
		For completing the module	For admission to the module exam	
"Testing Strategies" lecture	4			
"Bioanalytics; Analyzing Residue and Contaminants" lecture	2			-
Lab course	Supervision: 15 hr		3 logs, approx. 20 pp. each	-

Offered:	Summer semester
Prerequisite for taking the module:	Successful completion of M1.1
Teaching unit(s):	Nutritional Science

IEW- M2.3 Human Toxicology	Number of credit points (CP): 6
Module type (mandatory or elective):	Listed in the respective discipline-specific Regulations for Study and Examinations.
Content and objective of module:	

Contents:

- Foundations of clinical chemical diagnostics
- Design and evaluation of human studies
- Basic principles of therapy for poisoning
- Foundations of diagnosis and treatment of acute intoxication
- Acute poisoning by pharmaceuticals; acute and chronic poisoning by chemicals and other poisons (e.g. household chemicals, bacterial toxins, animal- and plant-based poisons), addictive substances

Objectives:

- The students have mastered the foundations of clinical chemical diagnostics and have basic knowledge of how to compile findings based on the results of analysis.
- The students possess basic knowledge of clinical therapy for intoxication using prominent toxins as examples.
- The students have basic knowledge of microbiology and are familiar with major microbiological risks to human beings.

Module (partial) exam(s) (number, form, scope):	Written exam (90 min)
Independent study time (in hours):	120 hr

Courses (type of teaching)	Contact time (in semester hours)	Supplementary exam work (Number, form, scope)		Module partial exam (Number, form, scope)
		For completing the module	For admission to the module exam	
"Studies on Humans, Clinical Diagnostics, and Toxicology" lecture	2			
"Microbiology and Microbiological Risks" lecture	2			

Offered:	Summer semester
Prerequisite for taking the module:	Successful completion of M1.1
Teaching unit(s):	Nutritional Science in cooperation with the DIfE

IEW-M3.1 Applied Toxicology, Regulatory Toxicology and Risk Assessment	Number of credit points (CP): 15
Module type (mandatory or elective):	Listed in the respective discipline-specific Regulations for Study and Examinations.
Content and objective of module:	

Contents:

- Foundations of the legal system and institutions, national and international organization concerned with the risks of substances
- Risk and danger, risk assessment, risk management, and risk communication
- Toxicity endpoints and their significance for risk assessment
- Regulation of carcinogenic substances
- Toxicity thresholds and criteria for calculating them
- Exposure assessment and estimation
- Practical deepening of the content of completed modules through a specialization research internship at a scientific research institution working in toxicology

Objectives:

- The students are familiar with the principles of regulatory toxicology and understand the interaction between risk assessment, risk management, and risk communication.
- The students possess profound knowledge on calculating toxicity thresholds.
- The students can interpret and evaluate risk assessments.
- The students can work practically on a toxicological question with guidance and present, discuss, and assess the results for a presentation.
- The students can work on a practical question autonomously in pairs after an introductory lesson by the supervisor.

Module (partial) exam(s) (number, form, scope):	Written exam, 90 min (50%), thematically related to lecture; presentation, 30 min (50%), on specialization research internship
Independent study time (in hours):	225 hr

Courses (type of teaching)	Contact time (in semester hours)	Supplementary exam work (Number, form, scope)		Module (partial) exam (Number, form, scope)
		For completing the module	For admission to the module exam	
"Regulatory Toxicology and Risk Assessment" lecture	2			
Specialization research internship (4 weeks)	Supervision: 20 hr			
Seminar accompanying research internship	1			

Offered:	Winter semester
Prerequisite for taking the module:	Successful completion of M1.1, M1.2, M1.3, M1.4
Teaching unit(s):	Nutritional Science in collaboration with BfR and DIfE

Reasoning for partial exams:

The written exam and the oral presentation call upon different competencies. Whereas the students demonstrate their knowledge of selected lecture topics in the written exam, in the oral presentation they show their capacity to describe scientific issues self-sufficiently aloud during a limited time frame. Furthermore, the partial examinations increase the variety of assessment.

IEW-M3.2 Practical Toxicology – Industry				Number of credit points (CP): 15
Module type (mandatory or elective):		Listed in the respective discipline-specific Regulations for Study and Examinations.		
Content and objective of module:				
Contents: • Practical toxicological work for industry • Composing a written internship report and presenting and discussing the work completed **Objectives:** • The students learn the processes and toxicological methods used in industry. • The students can document their work in writing and present it to an audience of toxicologists as an oral and poster presentation.				
Module (partial) exam(s) (number, form, scope):		Report, approx. 40 pp. (50%), on advanced internship Presentation, 30 min, combined with a poster presentation (50%) on the seminar		
Independent study time (in hours):		245 hr		
Courses (type of teaching)	Contact time (in semester hours)	Supplementary exam work (Number, form, scope)		Module partial exam (Number, form, scope)
		For completing the module	For admission to the module exam	
Advanced internship in industry (6 weeks)	Supervision: 15 hr			
Seminar	1			
Offered:		Winter semester		
Prerequisite for taking the module:		Successful completion of M1.1, M1.2, M1.3, M1.4		
Teaching unit(s):		Nutritional Science		

Reasoning for partial exams in IEW-M3.2-3.4:

The presentation and the graded internship report call upon different competencies. Whereas the students demonstrate both their knowledge of a selected seminar topic and their ability to present orally in the presentation, in the internship report they show their capacity to describe scientific issues self-sufficiently. Furthermore, the partial examinations increase the variety of assessment.

<table>
<tr><td colspan="3">IEW-M3.3 Practical Toxicology - Authorities</td><td colspan="3">Number of credit points (CP): 15</td></tr>
<tr><td colspan="2">Module type (mandatory or elective):</td><td colspan="4">Listed in the respective discipline-specific Regulations for Study and Examinations.</td></tr>
<tr><td colspan="2">Content and objective of module:</td><td colspan="4"></td></tr>
<tr><td colspan="6">Contents:
• Practical toxicological work in a regulatory agency
• Composing a written internship report and presenting and discussing the work completed

Objectives:
• The students learn the processes and toxicological methods used in a regulatory agency.
• The students can express their work in writing and present it to an audience of toxicologists.</td></tr>
<tr><td colspan="2">Module (partial) exam(s) (number, form, scope):</td><td colspan="4">Report, approx. 40 pp. (50%), on advanced internship
Presentation, 30 min, combined with a poster presentation (50%) on the seminar</td></tr>
<tr><td colspan="2">Independent study time (in hours):</td><td colspan="4">245 hr</td></tr>
<tr><td colspan="6"></td></tr>
<tr><td rowspan="2">Courses (type of teaching)</td><td rowspan="2">Contact time (in semester hours)</td><td colspan="2">Supplementary exam work (Number, form, scope)</td><td rowspan="2">Module partial exam (Number, form, scope)</td></tr>
<tr><td>For completing the module</td><td>For admission to the module exam</td></tr>
<tr><td>Advanced internship at a regulatory agency (6 weeks)</td><td>Supervision: 15 hr</td><td></td><td></td><td></td></tr>
<tr><td>Seminar</td><td>1</td><td></td><td></td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td colspan="2">Offered:</td><td colspan="4">Winter semester</td></tr>
<tr><td colspan="2">Prerequisite for taking the module:</td><td colspan="4">Successful completion of M1.1, M1.2, M1.3, M1.4</td></tr>
<tr><td colspan="2">Teaching unit(s):</td><td colspan="4">Nutritional Science</td></tr>
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<tr><td colspan="4">IEW-M3.4 Practical Toxicology - Applied Research</td><td>Number of credit points (CP): 15</td></tr>
<tr><td colspan="3">Module type (mandatory or elective):</td><td colspan="2">Listed in the respective discipline-specific Regulations for Study and Examinations.</td></tr>
<tr><td colspan="3">Content and objective of module:</td><td colspan="2"></td></tr>
<tr><td colspan="5">Contents:
• Practical toxicological work at a scientific institution
• Composing a written internship report and presenting and discussing the work completed

Objectives:
• The students learn the processes and toxicological/analytical methods used in a scientific institution.
• The students can express their work in writing and present it to an audience of toxicologists.</td></tr>
<tr><td colspan="3">Module (partial) exam(s) (number, form, scope):</td><td colspan="2">Report, max. 40 pp., on advanced internship
Presentation, 30 min, combined with a poster presentation on the seminar</td></tr>
<tr><td colspan="3">Independent study time (in hours):</td><td colspan="2">245 hr</td></tr>
<tr><td colspan="5"></td></tr>
<tr><td rowspan="2">Courses (type of teaching)</td><td rowspan="2">Contact time (in semester hours)</td><td colspan="2">Supplementary exam work (Number, form, scope)</td><td rowspan="2">Module partial exam (Number, form, scope)</td></tr>
<tr><td>For completing the module</td><td>For admission to the module exam</td></tr>
<tr><td>Advanced internship at DIfE, FhI, or IEW, for example (6 weeks)</td><td>Supervision: 15 hr</td><td></td><td></td><td></td></tr>
<tr><td>Seminar</td><td>1</td><td></td><td></td><td></td></tr>
<tr><td colspan="5"></td></tr>
<tr><td colspan="3">Offered:</td><td colspan="2">Winter semester</td></tr>
<tr><td colspan="3">Prerequisite for taking the module:</td><td colspan="2">Successful completion of M1.1, M1.2, M1.3, M1.4</td></tr>
<tr><td colspan="3">Teaching unit(s):</td><td colspan="2">Nutritional Science, DIfE, Fraunhofer</td></tr>
</table>

Appendix 2: Recommended course of study for the Master's program beginning in the winter semester

1st semester	2nd semester	3rd semester	4th semester
IEW-M1.1 Principles of Toxicology Mandatory module **2V 1S 2WoP** **12 CP**	IEW-M2.1 Special Topics in Toxicology Mandatory module **4V 1S** **9 CP**	IEW-M3.1 Applied Toxicology, Regulation, and Risk Assessment Mandatory module 2V 1S 4WoP **15 CP**	Master's Thesis **30 CP**
IEW-M1.2 Pharmacology, Pathophysiology, and Anatomy Mandatory module 2V **6 CP**	IEW-M2.2 Experimental Toxicology Mandatory module 6V 3WoP **15 CP**	IEW-M3.2, IEW-M3.3, IEW or M3.4 Practical Toxicology Elective module 1S 6WoP **15 CP**	
IEW-M1.3 Organ Toxicology and Pathological Anatomy and Histopathology Mandatory module 2V 1WoP **6 CP**	IEW-M2.3 Human Toxicology - Mandatory module 4V **6 CP**		
IEW-M1.4 Laboratory Animal Science Mandatory module 2V 2WoP **6 CP**			
30 CP	**30 CP**	**30 CP**	**30 CP**