

## English Translation

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### **Academic Regulations and Procedures for Students of the Infection Biology Master Program at the Universität zu Lübeck Awarding the Degree “Master of Science”**

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#### **§ 1**

#### **Area of Application**

These academic regulations and procedures of the “Infection Biology” master program are valid in connection with the *Examination Rules and Regulations of the Universität zu Lübeck for Students of the Bachelor and Master Programs (Examination Rules)* at the Universität zu Lübeck.

#### **§ 2**

#### **Program Objective**

(1) The Master in Infection Biology comprehensively prepares graduates for scientific and applied research in the field of human and animal pathogens. Worldwide, infections are the main causes of increased mortality and morbidity, confronting society with health policy challenges, which require the expertise of well-trained university graduates for research and practice in basic science, clinical and pharmaceutical research and development, in teaching and training as well as in diagnostics, epidemiology and health policy.

(2) Based on the problematic nature of pathogen-host interactions in infections, students will receive extensive theoretical and practical training in dealing with biological systems. They will acquire the skills to use this knowledge to combat infectious diseases as well as to contribute to other biomedical research areas. In addition to scientific and technical skills, students will also learn essential skills for scientific communication using the English language. Critical analyzation of published data and methods, the ability to document one’s own data, being able to present scientific content in oral and written form as well as to formulate research proposals are all part of the learning, as is the development of skills for both independent scientific work and participation in interdisciplinary work groups and honing teamwork skills. Skills acquired through lectures and seminars will be applied in various internships (aka practicals/work placements) for the analysis of scientific problems and designing practical, feasible solutions for current scientific issues. This includes creating awareness of the ethical implications of biomedical research and imparting basic skills for social discourse on research. The

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independent selection of research topics by the students as well as the autonomous organization of research abroad or in industry, within the context of internships or the master thesis, is strongly encouraged. At the end of the degree program, students should be able to competently, independently and successfully use their knowledge and skills in academic or industrial environments.

(3) The degree program is internationally oriented, as infectious diseases pose a global problem. For this reason, foreign applicants will also be targeted for admission. The lectures, seminars and internships offered in the master program in Infection Biology address microbiology, immunology, cell biology, biochemistry, biophysics, the clinical presentation (pathogenesis, diagnosis, treatment, prophylaxis/prevention) and epidemiology of infectious diseases and their pathogens (bacteria, viruses, parasites, fungi), both fundamentally and intensively.

### **§ 3**

#### **Admission to the Degree Program**

(1) Admission requirements for the master degree program "Infection Biology", which the applicant must provide evidence of, are as follows:

1. A bachelor degree in biology, biochemistry, human biology or the second state examination for human or veterinary medicine or a related field, for which the applicant must prove,

a) that she or he has earned a bachelor degree or the equivalent degree in biology, biochemistry or human biology or the second state exam for human or veterinary medicine or in a closely-related program of study at a German university or at a university that belongs to a country participating in the Bologna Process, or

b) that she or he has earned an equivalent degree in a closely-related program of study at a foreign university.

The equivalence of a bachelor degree will be accepted without further verification if it has been accredited by a specialized accrediting agency according to the guidelines set out by the Accreditation Council and the accreditation was valid at the time of graduation. The equivalence of a foreign degree will be determined according to the assessment proposals of the Central Office for Foreign Education at the Standing Conference of Ministers of Education and Cultural Affairs ([www.anabin.de](http://www.anabin.de)).

2. Proof of special qualifications, in which the first degree was completed with a grade of 2.3 or better.

3. Proof of sufficient knowledge of English in accordance with CEFR C1 (e.g. language tests TOEFL, IELTS).

(2) The Examination Board makes all decisions concerning the evidence provided and the fulfillment of the stated application requirements.

(3) If the qualifying program of study has not yet been completed at the time of application, but the bachelor thesis has already been begun, the submission of proof of examinations resulting in a minimum of 150 credit points and an average score of at least 2.3 is sufficient for conditional admittance. In this case, evidence of the successful completion of the degree must be submitted within three months of beginning the studies. Failure to do so will result in disenrollment.

(4) Admission will be denied if the candidate for the master examination or the diploma examination has failed an Infection Biology degree program or a related program at a university, equivalent school of higher learning or a university of applied sciences within the scope of the Higher Education Act or if involved in a review process in said degree program.

(5) Students cannot be simultaneously enrolled in the Infection Biology master program and the Molecular Life Science bachelor or master program.

(6) Admission into the degree program can only take place in the winter semester.

#### **§ 4**

#### **Curriculum**

The program is divided into the following sections:

1. Infection biology (infection biology, immunology, medical microbiology)
2. Cellular and molecular microbiology (structural biology, diagnosis, therapy and prophylaxis/prevention, pathogen-host interaction)
3. Interdisciplinary competences (ethics, scientific writing) and clinical aspects (clinical aspects, bioinformatics, model systems)
4. Internships and Consolidation in Infection Biology modules (in the fields of infection biology and/or cellular and molecular microbiology)
5. Master thesis (in the fields of infection biology or cellular and molecular microbiology).

#### **§ 5**

#### **Structure and Scope of the Degree Program**

(1) The degree program courses comprise a total of 120 credit points (KP) according to ECTS standards, with a prescribed period of study of two years. Credit points earned per teaching module:

- in the compulsory section Infection Biology, 17 credit points (KP)
- in the compulsory section Cellular and Molecular Microbiology, 11 KP
- in the compulsory section Competencies and Clinical Aspects, 25 KP
- in the subject-specific optional courses of Infection Biology, 6 KP

- in the subject-specific optional courses of Cellular and Molecular Microbiology, 9 KP
- in the interdisciplinary optional internships and consolidation modules, 22 KP
- the master thesis, 30 KP, with a final colloquium.

(2) Participation in further training modules offered by the university, which are beyond those specified in paragraph 2 of the module handbook, is possible and recommended. The results of such examinations can, upon request, be listed in the Diploma Supplement.

(3) The teaching modules of the individual sections and the optional courses are listed in the annex and described in detail in the module handbook.

## **§ 6**

### **Course-related Subject Examinations**

Course-related subject examinations for the modules in the appendix to these academic regulations and procedures must be passed for the master examination. The execution of the subject examinations shall be regulated by the Examination Rules and Regulations.

## **§ 7**

### **Internships**

For the master examination, two internships must be completed for a total of 22 weeks; one of the internships must have a duration of at least three months. The internships are for practical training and to prepare for future jobs. For this purpose, working in a business enterprise is just as suitable as that in non-university or university research institutions, provided that the activity conducted there has to do with ongoing research and development issues of the respective department and satisfies the demands made on a graduate of the master program in Infection Biology. The decision on this is made on an individual basis by the Examination Board.

## **§ 8**

### **Language of Instruction**

The language of instruction is English. In deviation from § 10 paragraphs 2 and 3 of the Examination Rules and Regulations, the coursework and assessments will, as a rule, take place in English.

## **§ 9**

### **Master Examination and Examination Prerequisites**

(1) The master examination consists of course-related subject examinations for the individual teaching modules and the master thesis with a final colloquium. Examinations in accordance with § 10 paragraph 1 in conjunction with §§ 11 ff. PVO lead to category A and B performance certificates.

(2) In principle, admission to the course-related subject examinations occurs, in accordance with § 9

PVO, with the enrollment in the Infection Biology master program. For admission to a subject examination, according to §9 paragraph 2 PVO, there could be specific prerequisites defined in the module handbook before the semester in which the module is offered. Prerequisites must be completed and proof submitted before the time of the examination; they are not included in the module grade.

(3) The application for permission to do the master thesis is, in accordance with § 9 paragraph 4 PVO, to be made separately in writing to the chairperson of the Examination Board.

## **§ 10**

### **Prerequisites for the Master Thesis**

The authorization to commence work on the master thesis (§ 13 of the Examination Rules) can only take place when the requirements according to § 9 of the Examination Rules have been fulfilled, a student is at least in the third semester and has submitted proof of completion of at least 70 ECTS through performance certificates in categories A and B along with the application. The internships must have been completed; however module examinations may still be pending.

## Appendix I to Academic Regulations and Procedures for the Infection Biology Master Program of the Universität zu Lübeck: Scope of the Requirements and Methods of Assessment for the Master Examination

### 1. Preliminary remarks

In the following tables, the teaching modules (LM) are listed for which performance certificates (LZF) must be earned in order to pass the master examination, divided into the various fields of study. For each teaching module the amount of average contact hours per week (SWS), the type – lecture (V), laboratory (Ü), internship (P) or seminar (S) – the number of credit points (KP) and the type of performance certificate – category A or B – are indicated. The following table shows the requirements and assessment methods for the master examination. The list includes how the assessments are usually made. Written examinations and assignments are marked with a “K”, oral examinations / viva voce with an “M” and each internship report with a “T”. Optional modules are marked with a “WP”. Further details, such as learning objectives and content, the required coursework or the type of examination are described in the module handbook (MHB).

### 2. General instructions and rules for the selection of teaching modules

Students have freedom of choice concerning the optional courses (LV), taking into account the examination requirements. The following rules must be observed:

- LV cannot be counted more than once,
- LV, which have already been used for the certificate or Diploma Supplement of the qualifying bachelor degree program, cannot be selected,
- of the optional courses, only a limited number of LV and only with sufficient demand can be offered in each academic year.

### Infection Biology – Teaching Modules

Module Number	Module	SWS	KP	Type of Certificate	Type of Assessment
Subsection Infection Biology					
LS 4015	Infection Biology 1	4V	6	A	M, K
LS 4145	Infection Biology 2	2V + 3P	5	A	M, K, T
LS 4035	Immunology	4V	6	A	M, K
LS 4175	Medical Microbiology (WP)	4S	6	A	M, K
Subsection Cellular and Molecular Microbiology					
LS 4045	Diagnosis of Infectious Diseases	2V + 2P + 1S	5	A	M, K, T
LS 4155	Anti-microbial Therapy and	2V +	6	A	M, K

	Prophylaxis	2S			
LS 4020 IB	Infectiological Structural Analysis (WP)	4V	6	A	M, K
LS 4185	Pathogen-Host Interaction (WP)	2V	3	A	M, K
Subsection Competences and Clinical Aspects					
CS 4011	Biomathematics, Modelling and Biostatistics	2V + 1Ü	4	A	K, M
LS 4025	Clinical Aspects of Infectiology	3V + 1Ü	5	A	M, K, T
LS 4165	Model Systems of Infection	3V + 2S + 2P	9	A	K, M, T
PS 4610	Ethics in Research / Scientific Writing	2V + 2S	7	B	M, T
Subsection Interdisciplinary Internships and Consolidation Modules					
LS 4115	Internships (WP)	24P	16	A	M, T
LS 5200	Consolidating in Infection Biology (WP)*	2V/S	6	B	M
Subsection Master Thesis					
LS 5995	Infection Biology Master Thesis		30	A	
	<b>Total</b>		<b>120</b>		

\* The optional modules come under the subject areas "Infection Biology" and "Cellular and Molecular Microbiology". Every winter semester, a minimum of four modules from each of the two subject areas are offered.

**Appendix II to Academic Regulations and Procedures for the Infection Biology Master Program of the Universität zu Lübeck: Curriculum**

**Appendix II: Infection Biology Master Curriculum**

Semester	Infection biology	Cellular and Molecular Microbiology	Interdisciplinary Section and Clinical Aspects	KP / SWS
<b>1.</b>	<b>LS4015 Infection Biology 1</b>	<b>LS4020-IB Structural Biology of Infection</b> [Compulsory; choice of 2 courses] <b>A Protein Structure/Crystallography</b> <b>B Biological NMR Spectroscopy</b> <b>C Single Molecule Methods</b> <b>D Microscopy: techniques and applications</b> <b>E Basics of Membrane Biophysics</b> <b>F Protein Biophysics</b>	<b>LS4025 Clinical Aspects of Infection</b>	
KP	6	6	5	
V/Ü/P/S	4 / 0 / 0 / 0	2V each	3 / 1 / 0 / 0	
	<b>LS4035 Immunology</b>	<b>LS4045 Diagnosis of Infectious Diseases</b>	<b>CS4011 Bioinformatics, Modelling, Biostatistics</b> [Compulsory; choice of 1 course] <b>A Introduction to Bioinformatics</b> <b>B Modeling biological systems</b> <b>C Genetic epidemiology</b> <b>D Microarray Data analysis</b>	
KP	6	5	4	32
V/Ü/P/S	4 / 0 / 0 / 0	2 / 0 / 2 / 1	2 / 1 / 0 / 0	24
<b>2.</b>	<b>LS4145 Infection Biology 2</b>	<b>LS4155 Anti-microbial Therapy and Prophylaxis</b> <b>A Therapies</b> <b>B Vaccination strategies</b>	<b>LS4165 Model Systems of Infection</b>	
KP	5	6	9	
V/Ü/P/S	2 / 0 / 3 / 0	1 / 0 / 0 / 1    1 / 0 / 0 / 1	3 / 0 / 2 / 2	



	<b>LS4175 Medical Microbiology</b> [Compulsory; choice of 2 courses] <b>A Molecular Virology</b> <b>B Bacterial Virulence Factors</b> <b>C Pathogen Niches</b> <b>D Inflammation</b>	<b>LS4185 Host-Pathogen Interaction</b> [Compulsory; choice of 1 course] <b>A Principles and Analysis of HPI</b> <b>B Rational Drug Design</b>		
KP	6	3		29
V/Ü/P/S	2S each	2 / 0 / 0 / 0		22
<b>3.</b>	<b>LS4115 Practical Course</b>			
KP	16			
V/Ü/P/S	0 / 0 / 24 / 0			
	<b>LS5205 Consolidation in Infection Biology</b> [Compulsory; choice of 2 courses]			
KP	6			
V/Ü/P/S	2S each			
	<b>Start Master Thesis MIB</b>			
	6			
<b>4.</b>	<b>LS5995 Master Thesis MIB</b>			
KP	24			28
SWS				28
			<b>PS4610 Ethics in Science / Scientific Writing</b>	
KP			7	31
SWS			2 / 0 / 0 / 0      0 / 0 / 0 / 2	4
<b>1. – 4.</b>				<b>120</b> <b>80</b>

**LS5205 Consolidation in IB:**

LS5205-IB1:	Tuberculosis
LS5205-IB2:	Virus Host Interaction
LS5205-SG:	Structural Aspects of Protein biosynthesis
LS5205-ZB:	Cell Biology of the Senses
LS5205-ZF:	Gene Expression
LS5205-ZH:	DNA damage response in of malign lymphomas during pathogenesis
LS5205-ZI:	Molecular marker of malignant lymphomas
LS5205-ZK:	Cellular Microbiology & Inflammatory Diseases
LS5205-ZL:	Animals in experimental neuropharmacology
LS5205-ZM:	Molecular biology of virus infections of cytopathogenic and non-cytopathogenic viruses
LS5205-ZN:	Chronobiology