

These degree programme and examination regulations have been worded carefully to be up to date; however, errors cannot be completely excluded. The official German text available at the Examinations Office is the version that is legally binding.

## **Degree Programme and Examination Regulations for the Bachelor's Degree Programme in Integrated Life Sciences**

### **Biology, Biomathematics and Biophysics (BSc ILS) and the Master's Degree Programme in Integrated Life Sciences – Biology, Biomathematics and Biophysics (MSc ILS) at the Faculty of Sciences of Friedrich-Alexander-Universität Erlangen-Nürnberg**

**- FPOILS -**

**Dated 22 July 2015**

Based on Section 13 (1)(2), Section 43 (5)(2), Section 61 (2)(1) of the Bavarian Higher Education Act (Bayerisches Hochschulgesetz, BayHSchG), the University of Erlangen-Nürnberg enacts the following examination regulations:

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## **I. General Conditions**

### **Section 37 Scope**

The Degree Programme and Examination Regulations for the Bachelor's Degree Programme in Integrated Life Sciences – Biology, Biomathematics and Biophysics (BSc ILS) and the Master's Degree Programme in Integrated Life Sciences – Biology, Biomathematics and Biophysics (MSc ILS) complement the current version of the General Examination Regulations for the Bachelor's Degree Programme in Biology (BSc Biology), the Master's Degree Programme in Cell and Molecular Biology (MSc ZMB), the Bachelor's Degree Programme in Integrated Life Sciences – Biology, Biomathematics and Biophysics (BSc ILS) and the Master's Degree Programme in Integrated Life Sciences – Biology, Biomathematics and Biophysics (MSc ILS) at the Faculty of Sciences of Friedrich-Alexander-Universität Erlangen-Nürnberg (ABMPO-Bio/NatFak).

### **Section 38 Bachelor's Degree Programme, Standard Duration of Studies**

<sup>1</sup>The Bachelor's degree programme in ILS shall consist of modules worth 180 ECTS credits distributed over six semesters. <sup>2</sup>This shall include the period for working on the Bachelor's thesis.

### **Section 39 Master's Degree Programme, Standard Duration of Studies, Teaching Language**

(1) <sup>1</sup>The Master's degree programme in ILS builds on the contents of the Bachelor's degree programme in ILS. <sup>2</sup>It shall consist of modules worth 120 ECTS credits including the Master's thesis distributed over four semesters.

(2) <sup>1</sup>Courses and examinations shall usually be held in English. <sup>2</sup>The module handbook shall govern this topic in more detail.

### **Section 40 Composition of the Examinations Committee**

<sup>1</sup>The Examinations Committee for the Bachelor's and Master's degree programmes in ILS shall consist of three members, one each from the departments of Biology, Physics and Mathematics. <sup>2</sup>The chairperson, their representative and the further members of the Examinations Committee shall be professors from the departments of Biology, Physics and Mathematics appointed by the Faculty of Sciences' Faculty Council based on the departments' recommendation.

## **II. Special Provisions**

### **1. Bachelor's Examination**

#### **Section 41 Structure of the Bachelor's Degree Programme**

<sup>1</sup>The distribution across the semesters, the type and duration of the examinations in the modules and the required number of ECTS credits are set forth in Appendix 1. <sup>2</sup>The nature of the examinations for the compulsory elective modules according to

Section 42 (2) varies depending on the chosen module and shall be published in the module handbook before the start of the lecture period.

### **Section 42 Grundlagen- und Orientierungsprüfung (GOP)**

(1) The Grundlagen- und Orientierungsprüfung (GOP) shall consist of the following modules:

- ILS-M1 Mathematics for Integrated Life Sciences I (10 ECTS credits)
- ILS-P1 Foundations of experimental physics (5 ECTS credits)
- ILS-B1 Foundations of cell biology (7.5 ECTS credits)

(2) The GOP shall have been passed when all modules listed in Paragraph 1 have been evaluated as 'bestanden' (passed) or with a grade of at least 'ausreichend' (sufficient).

### **Section 43 Bachelor's Examination**

(1) <sup>1</sup>The Bachelor's examination shall consist of the examinations in the compulsory modules including the Bachelor's thesis module and in two integrated compulsory modules according to **Appendix 1**. <sup>2</sup>The Bachelor's thesis module shall consist of a Bachelor's thesis worth 12 ECTS credits and a seminar presentation on the Bachelor's thesis worth 3 ECTS credits.

(2) <sup>1</sup>Students may choose between the following integrated compulsory elective modules in the sense of Paragraph 1:

1. Compulsory elective module: Biophysics
2. Computational biology
3. Compulsory elective module: Molecular biology

<sup>2</sup>The modules 'Computational biology' and 'Compulsory elective module: Molecular biology' each consist of two separate modules (parts 1 and 2) which must both be completed. <sup>3</sup>The Examinations Committee shall decide whether to allow alternative compulsory elective modules at the student's request. <sup>4</sup>A compulsory elective module may only be allowed if it is consistent with the aims of the degree programme and the examinations, if the subject in question is represented by a professor and if the Faculty responsible possesses the resources required to ensure that the module can be studied properly.

### **Section 44 Bachelor's Thesis**

(1) Students are required to have achieved at least 90 ECTS credits in order to be allocated a subject for the Bachelor's thesis.

(2) <sup>1</sup>The Bachelor's thesis is supposed to show that the student is capable of dealing with a problem from the field of the degree programme in Integrated Life Sciences – Biology, Biomathematics and Biophysics independently according to academic methods within a set period and presenting the results in an appropriate form.

<sup>2</sup>Requirements for the Bachelor's thesis shall be such that it can be completed within three months.

(3) <sup>1</sup>The Bachelor's thesis shall generally be completed in a working group at one of the departments involved in the degree programme in ILS. <sup>2</sup>The chairperson of the Examinations Committee may give approval for the Bachelor's thesis to be completed in other working groups upon request.

(4) <sup>1</sup>All full-time university lecturers and lecturers who have completed a habilitation who are involved in the ILS degree programme (supervisors) shall be entitled to allocate subjects for Bachelor's theses. <sup>2</sup>The Examinations Committee shall have the right to grant and regulate exceptions.

(5) <sup>1</sup>The Bachelor's thesis shall generally be evaluated by the supervisor and another examiner appointed by the chairperson of the Examinations Committee. <sup>2</sup>The chairperson of the Examinations Committee shall usually work towards the thesis being graded within one month.

## 2. Master's Examination

### Section 45 Composition of the Admissions Committee for the Master's Degree Programme

<sup>1</sup>The Admissions Committee for the Master's degree programme in ILS shall consist of one university lecturer from the Department of Biology, the Department of Physics or the Department of Mathematics who shall assume the role of chairperson and two further university lecturers. <sup>2</sup>The two further members of the Admissions Committee shall be members of the two departments listed in Sentence 1 of which the chairperson is not a member. <sup>3</sup>The members and two alternative members for each shall be appointed by the Faculty of Sciences' Faculty Council at the recommendation of the departments of Biology, Physics and Mathematics.

### Section 46 Qualification for a Master's Degree, Certificates and Admission Requirements

(1) <sup>1</sup>A subject-specific degree within the meaning of Section 31 (1)(1) **ABMPO-Bio/NatFak** is a Bachelor's degree or a Diplom degree in the subject integrated life sciences. <sup>2</sup>Bachelor's degrees in biology, biophysics, physics, biomathematics and mathematics in particular shall be recognised as subject-related degrees within the meaning of Section 31 (1)(1) **ABMPOBio/NatFak**. <sup>3</sup>Applicants with a subject-related degree shall only be admitted to the Master's degree programme after passing an oral admission examination.

(2) The application for admission to the qualification assessment process according to Paragraph 2 (2)(3) of the **Appendix to ABMPOBio/NatFak** shall include proof of English language proficiency at level B2 (Common European Framework of Reference for Languages – CEFR) vantage or upper intermediate.

(3) In the oral admission examination according to Paragraph 5 (3) et seq. of the **Appendix to ABMPOBio/NatFak**, applicants shall be evaluated according to the following criteria:

1. Previous education, in particular the performance in the previous degree programme (weighting 1/3)
2. Knowledge of topics and methods in the field of mathematics and in the field of physics or molecular biology (weighting 1/3)
3. Ability to make interdisciplinary connections between biology, physics and mathematics (weighting 1/3)

### **Section 47 Content, Scope and Structure of the Master's Degree Programme**

(1) <sup>1</sup>The Master's examination shall consist of the required module examinations including the Master's thesis module. <sup>2</sup>The Master's examination shall have been passed when all of the following required module examinations and the Master's thesis module – worth a total of 120 ECTS credits – have been passed according to **Appendix 3**:

1. Compulsory and compulsory elective modules from one of the possible module groups MG1, MG2 and MG3 worth 30 ECTS credits.
2. Compulsory and compulsory elective modules from another of the possible module groups MG1, MG2 and MG3 worth 40 ECTS credits.
3. A specialisation module worth 20 ECTS credits.
4. The Master's thesis module worth 30 ECTS credits.

(2) <sup>1</sup>In addition to the module examinations, students may be given the option to complete written exercises, computer-based exercises or presentations to assess their progress (mid-term examinations) on a voluntary basis. <sup>2</sup>Further details, in particular information on the number, type and scope of tasks, shall be published in the module handbook before the start of the lecture period.

(3) Other permissible compulsory elective modules in the sense of Paragraph (1)(2)(1) and (1)(2)(2) may be approved by the Examinations Committee and published in the module handbook before the start of the lecture period upon request, providing that their content is consistent with the aims of the degree programme.

(4) <sup>1</sup>Before starting the Master's degree programme, each student shall choose one of the full-time professors from the Faculty of Sciences involved in the degree programme to act as a mentor. <sup>2</sup>Mentors shall advise students in particular on the selection of compulsory elective modules and shall help them with questions regarding their studies. <sup>3</sup>This mentoring relationship shall be maintained throughout the Master's degree programme.

### **Section 48 Master's Degree Examinations**

The distribution across the semesters, type and duration of the module examinations and the required number of ECTS credits are set forth in **Appendix 2** and in the module handbook.

### **Section 49 Master's Thesis**

(1) Students are required to have achieved at least 60 ECTS credits in order to be allocated a subject.

(2) <sup>1</sup>The Master's thesis is an examination paper that concludes the Master's degree. <sup>2</sup>It is supposed to show that the student is capable of dealing with a problem from the field of the degree programme in Integrated Life Sciences – Biology, Biomathematics and Biophysics (ILS) independently and according to scientific methods within a set period, presenting the results in accordance with the standards of the field and using the correct language, and putting them in relation to current specialist literature. <sup>3</sup>It must have an international focus and be research-orientated. <sup>4</sup>Requirements for the thesis shall be such that it can be completed within a period of six months.

(3) The Master's thesis shall generally be written in English; the Examinations Committee shall decide whether to grant exceptions.

(4) 30 ECTS credits shall be awarded for the Master's thesis.

(5) Section 44 (4) shall apply accordingly.

### **III. Concluding Provisions**

#### **Section 50 Legal Validity**

<sup>1</sup>These degree programme and examination regulations shall come into effect on the day after their publication. <sup>2</sup>They shall apply to all students who start the Bachelor's or Master's degree programme in Integrated Life Sciences – Biology, Biomathematics, Biophysics (ILS) in the winter semester 2015/2016 or later. <sup>3</sup>Students who study under the previously valid degree programme and examination regulations for the Bachelor's and Master's degree programmes in Integrated Life Sciences – Biology, Biomathematics, Biophysics (ILS) at the Faculty of Sciences of Friedrich-Alexander-Universität Erlangen-Nürnberg of 23 December 2009 in the version of 11 May 2015 shall be examined according to those regulations.

## Appendix 1: Study Plan for the Bachelor's Degree Programme in ILS

Module name	Course	SWS (semester hours)				Total ECTS credits	Distribution of workload per semester in ECTS credits						Type and scope of the examination/ course achievement	Module grade factor
		L	T	P	S		1st sem.	2nd sem.	3rd sem.	4th sem.	5th sem.	6th sem.		
<b>MMSfN (ILS-M1): Mathematics for Integrated Life Sciences I</b>	Mathematics for engineers I (course C)	4				10	5						<u>Portfolio examination:</u> EA: written examination 90 min. CA: voluntary homework (7 of 14 individual tasks) with bonus for the written examination (ungraded) CA: written computer-based test 50 min. (ungraded)	1
	Tutorial on the lecture: Mathematics for engineers I		2				1.5							
	Statistical methods for Integrated Life Sciences	1					2.5							
	Computer tutorial on the lecture: Statistical methods for Integrated Life Sciences		1				1							
<b>MfN (ILS-M2): Mathematics for Integrated Life Sciences II</b>	Mathematics for engineers II (course C)	4				5		3				<u>Portfolio examination:</u> EA: written examination 90 min. CA: voluntary homework (7 of 14 individual tasks) with bonus for the written examination (ungraded)	1	
	Tutorial on the lecture: Mathematics for engineers II		2					2						
<b>StochMod (ILS-M4): Stochastic models</b>	Stochastic models	2				5			3			<u>Portfolio examination:</u> EA: one written examination 90 min. CA: weekly homework (ungraded)	1	
	Tutorial: Stochastic models		1						1					
	Practical course: Stochastic models			1					1					
<b>(ILS-M5): Differential equation models</b>	Differential equation models	2				5				3		<u>Portfolio examination:</u> EA: written examination 90 min. CA: weekly homework (ungraded)	1	
	Tutorial: Differential equation models		2							2				
<b>MVBI (ILS-M6): Mathematical algorithms in bioinformatics</b>	Mathematical algorithms in bioinformatics	2				5				3		<u>Portfolio examination:</u> EA: written examination 90 min. CA: 7–10 pieces of weekly homework (ungraded)	1	
	Tutorial: Mathematical algorithms in bioinformatics		2							2				

Module name	Course	SWS (semester hours)				Total ECTS credits	Distribution of workload per semester in ECTS credits						Type and scope of the examination/ coursework achievement	Module grade factor
		L	T	P	S		1st sem.	2nd sem.	3rd sem.	4th sem.	5th sem.	6th sem.		
<b>ILS-P1: Foundations of experimental physics 1</b>	Foundations of experimental physics 1	3				5	4						EA: written examination 90 min.	1
	Tutorial: Foundations of experimental physics 1		1				1							
<b>ILS-P2: Foundations of experimental physics 2</b>	Foundations of experimental physics 2	3				5		4					EA: written examination 90 min.	1
	Tutorial: Foundations of experimental physics 2		1					1						
<b>ILS-P3: Foundations of experimental physics 3</b>	Laboratory course: Foundations of experimental physics			3		5		5					CA: approx. 10 reports with oral test on the experiments (ungraded)	0
<b>ILS-P4: Structural physics</b>	Structural physics	4				7.5			5				EA: written examination 90 min.	1
	Tutorial: Structural physics		2					2.5						
<b>ILS-P5: Physics of biological matter</b>	Physics of biological matter	3				7.5				4			EA: written examination 90 min.	1
	Tutorial: Physics of biological matter		3							3.5				
<b>ILS-B1: Foundations of cell biology and genetics</b>	Foundations of cell biology and genetics	5				7.5	7.5						EA: written examination 90 min.	1
<b>ILS-B2: Molecular biology</b>	Molecular biology	3				7.5		3.5					<u>Portfolio examination:</u> EA: written examination 90 min. CA: approx. 10 reports with oral test (ungraded)	1
	Tutorial: Molecular biology		5					4.0						
<b>ILS-B3: Biochemistry and physiology</b>	Biochemistry and physiology	3				7.5			4.0				<u>Portfolio examination:</u> EA: written examination 90 min. CA: approx. 3 reports (ungraded)	1
	Laboratory course: Biochemistry and physiology		3						3.5					
<b>ILS-B4: Cellular communication, signal processing, and development</b>	Cellular communication, signal processing, and development	3				7.5				4			<u>Portfolio examination:</u> EA: written examination 90 min. CA: 4 reports (ungraded)	1
	Laboratory course: Cellular communication, signal processing, and development		3							3.5				



Module name	Course	SWS (semester hours)				Total ECTS credits	Distribution of workload per semester in ECTS credits						Type and scope of the examination/ coursework achievement	Module grade factor
		L	T	P	S		1st sem.	2nd sem.	3rd sem.	4th sem.	5th sem.	6th sem.		
<b>ILS-C1: Introduction to chemistry</b>	General chemistry	4				5		3					EA: written examination 120 min.	1
	Tutorial: General chemistry		3					2						
<b>ILS-C2: Laboratory course: Chemistry</b>	Laboratory course: Chemistry			1.5		5		3					CA: approx. 10 reports (ungraded)	0
	Seminar for laboratory course: Chemistry				0.5			2						
<b>ILS-C3: Physical chemistry</b>	Foundations of physical chemistry	2				5			2.5				EA: written examination 90 min.	1
	Tutorial: Foundations of physical chemistry				2				2.5					
<b>ILS-I1: Optics and microscopy</b>	Optics and microscopy	1				5	1						EA: graded series of reports	1
	Laboratory course: Optics and microscopy		4					4						
<b>ILS-I2: Genome analysis and phylogeny</b>	Genome analysis and phylogeny	2				5			2.5				Portfolio examination: EA: written examination 90 min. CA: project report with short presentation 15 min. (ungraded)	1
	Practical course: Genome analysis and phylogeny			3					2.5					
<b>ILS-I3: Structural biology and crystallography</b>	Structural biology and crystallography	2				5			2				Portfolio examination: EA: written examination 60 min. (80% of module grade) EA: series of reports (20% of module grade)	1
	Tutorial: Structural biology		2						1.5					
	Tutorial: Crystallography		2						1.5					
<b>ILS-I4: Metabolic networks</b>	Metabolic networks	2				5				3			EA: written examination 90 min.	1
	Tutorial: Metabolic networks		2							2				

Module name	Course	SWS (semester hours)				Total ECTS credits	Distribution of workload per semester in ECTS credits						Type and scope of the examination/ course achievement	Module grade factor
		L	T	P	S		1st sem.	2nd sem.	3rd sem.	4th sem.	5th sem.	6th sem.		
<b>Compulsory elective module: Biophysics</b>	Lecture: Modern applications of biophysical methods	2				15					5		EA: approx. 9–10 graded colloquia and graded reports	1
	Laboratory course/seminar: Modern applications of biophysical methods			11							10			
<b>Compulsory elective module: Computational biology (part 1)</b>	Computational biology (part 1)	2				7.5					3		Portfolio examination: EA: written examination 90 min. (80% of module grade) EA: seminar presentation approx. 20 min. (20% of module grade)	1
	Tutorial and seminar: Computational biology (part 1)		4.5								4.5			
<b>Compulsory elective module: Computational biology (part 2)</b>	Computational biology (part 2)	2				7.5					3		written examination 90 min.	1
	Tutorial: Computational biology (part 2)		2.5	2							4.5			
<b>Compulsory elective module: Molecular biology<sup>1)</sup> (part 1)</b>	Lecture	2				5					5		EA: written examination 45 min.	2
<b>Compulsory elective module: Molecular biology<sup>1)</sup> (part 2)</b>	Laboratory course/seminar: Molecular biology		13			10					10		Portfolio examination according to module description <sup>2)</sup>	1
<b>Core skills<sup>3)</sup></b>	Dependent on module	4				5						5	CA: dependent on module (ungraded)	0
<b>Specialisation module</b>	Tutorials and seminars from the field of the Bachelor's thesis	4				5						5	CA: series of reports and/or <sup>4)</sup> homework (ungraded)	0
<b>Bachelor's module</b>	Bachelor's module seminar					15						3	EA: written assignment CA: short presentation approx. 20 min. (ungraded)	1
	Bachelor's thesis											12		
<b>Total SWS (semester hours):</b>		69	48–54	8.5–21.5	2.5									
		<b>Total ECTS credits:</b>				180	27.5	32.5	32.5	32.5	27.5	27.5		

<sup>1)</sup> Choice of subject modules from the Bachelor's degree programme in Biology.

<sup>2)</sup> The type and scope of the examination, whether achievements are examination and/or coursework achievements, and their weighting in the calculation of the module grade depends on the module chosen and is specified in the module handbook. One examination in the 'compulsory elective module: Molecular biology' generally takes the form of a portfolio examination consisting of a written examination (45 min.), a seminar presentation (20 min.) and a report on the experiments conducted in the laboratory course.

<sup>3)</sup> Core skills courses offered at FAU. An English language course or another course suggested by the Examinations Committee may be chosen as an alternative.

<sup>4)</sup> The coursework achievements required in the specialisation module depend on the chosen subject and the respective supervisor.

## Appendix 2: Study Plan for the Master's Degree Programme in Integrated Life Sciences

	Code	Title	Course	SWS (semester hours)				Total ECTS	Workload average in ECTS				Specification: examination/ungraded task	Grade factor
				L	T	P	S		1st sem.	2nd sem.	3rd sem.	4th sem.		
<b>Module group 1: Mathematical modelling and systems biology</b>														
compulsory modules	ILS-MA-M1	Introduction to statistics and statistical programming	Introduction to statistics	2				5		2			Portfolio examination: EA: written examination 90 min. CA: weekly exercises**	1
			Tutorial for introduction to statistics (problem session)		1					1.5				
			Lab class Statistical programming		1					1.5				
	ILS-MA-M2	Biomathematics	Biomathematics	4				10	7				Portfolio examination: EA: oral examination 30 min. or written examination 90 min.* CA: paper and computer exercises **	1
			Tutorial for biomathematics		2					3				
	ILS-MA-B1	Systems biology	Systems biology	2				5	3				EA: written examination 60 min.	1
Laboratory course: Systems biology				1					2					
<b>compulsory elective modules according to the handbook (10–20 ECTS)</b>														
specialisation	ILS-MA-VM	Advanced module	Lecture, seminar, practical training in chosen subject					20			20		EA: oral examination 30 min.	1
	ILS-MA-TH	Master's thesis	Master's thesis					30				30	EA: Master's thesis CA: scientific report, (presentation of results 30 min. (seminar and discussion))**	1
Total SWS:				8 <sup>+</sup>	5 <sup>+</sup>	0 <sup>+</sup>	0 <sup>+</sup>							
Total ECTS:								120	30 <sup>++</sup>	30 <sup>++</sup>	30 <sup>++</sup>	30		

\* The specific form of the examination depends on the type of course offered and chosen and is specified in the module handbook.

\*\* Unless otherwise specified, course achievements in tutorials are partial elements of the examination which are completed during the semester, are ungraded, and can be repeated an unlimited number of times.

+ Total SWS depend on the chosen elective module.

++ Deviations of +/- 2.5 per semester are possible, dependent on the choice of compulsory elective modules. Exactly 120 ECTS credits are accredited upon completion of the degree programme, but voluntary surplus modules are included in the transcript of records. If an elective module has more ECTS credits than required, the module grade contributes to the Master's degree according to the required credit weight.

	Code	Title	Course	SWS (semester hours)				Total ECTS credits	Workload average in ECTS				Specification: examination/ungraded task	Grade factor
				L	T	P	S		1st sem.	2nd sem.	3rd sem.	4th sem.		
<b>Module group 2: Bioimaging and biophysics</b>														
compulsory modules	ILS-MA-M1	Introduction to statistics and statistical programming	Introduction to statistics	2				5		2			Portfolio examination: EA: written examination 90 min. CA: weekly exercises**	1
			Tutorial for introduction to statistics (problem session)		1					1.5				
			Lab class Statistical programming		1					1.5				
	ILS-MA-I1A	Bioimaging & biophysics A	Bioimaging & biophysics I	2				7.5	2.5				Portfolio examination: EA: written examination 90 min. or oral examination 40 min.* CA: series of reports **	1
			Laboratory course for bioimaging & biophysics I		4					5				
	ILS-MA-I1B	Bioimaging & biophysics B	Bioimaging & biophysics II	2				7.5		2.5			Portfolio examination: EA: written examination 90 min. or oral examination 40 min.* CA: series of reports **	1
Laboratory course for bioimaging & biophysics II				4						5				
<b>compulsory elective modules according to the handbook (10–20 ECTS)</b>														
specialisation	ILS-MA-VM	Advanced module	Lecture, seminar, practical training in chosen subject					20			20		EA: oral examination 30 min.	1
	ILS-MA-TH	Master's thesis	Master's thesis					30				30	EA: Master's thesis CA: scientific report, (presentation of results 30 min. (seminar and discussion))**	1
Total SWS:				6 <sup>+</sup>	10 <sup>+</sup>	0 <sup>+</sup>	0 <sup>+</sup>							
Total ECTS:								120	30 <sup>++</sup>	30 <sup>++</sup>	30 <sup>++</sup>	30		

\* The specific form of the examination depends on the type of course offered and chosen and is specified in the module handbook.

\*\* Unless otherwise specified, course achievements in tutorials are partial elements of the examination which are completed during the semester, are ungraded, and can be repeated an unlimited number of times.

+ Total SWS depend on the chosen elective module.

++ Deviations of +/- 2.5 per semester are possible, dependent on the choice of compulsory elective modules. Exactly 120 ECTS credits are accredited upon completion of the degree programme, but voluntary surplus modules are included in the transcript of records. If an elective module has more ECTS credits than required, the module grade contributes to the Master's degree according to the required credit weight.

	Code	Title	Course	SWS (semester hours)				Total ECTS credits	Workload average in ECTS				Specification: examination/ungraded task	Grade factor
				L	T	P	S		1st sem.	2nd sem.	3rd sem.	4th sem.		
<b>Module group 3: Biological structures and processes</b>														
compulsory modules	ILS-MA-M1	Introduction to statistics and statistical programming	Introduction to statistics	2				5		2			Portfolio examination: EA: written examination 90 min. CA: weekly exercises**	1
			Tutorial for introduction to statistics		1					1.5				
			Lab class Statistical programming		1					1.5				
	ILS-MA-I2A	Interactions of biological macromolecules A	Interactions of biological macromolecules A	2				5	3				Portfolio examination: EA: written examination 120 min. or oral examination 60 min.* CA: exercise sheets **	1
			Seminar/tutorial for interactions of biological macromolecules A		1.5		0.5			2				
	ILS-MA-I2B	Interactions of biological macromolecules B	Interactions of biological macromolecules B	2				5	3				Portfolio examination: EA: written examination 120 min. or oral examination 60 min.* CA: exercise sheets **	1
Seminar/tutorial for interactions of biological macromolecules B				1.5		0.5			2					
<b>compulsory elective modules according to the handbook (15-25 ECTS)</b>														
specialisation	ILS-MA-VM	Advanced module	Lecture, seminar, practical training in chosen subject					20			20		EA: oral examination 30 min.	1
	ILS-MA-TH	Master's thesis	Master's thesis					30				30	EA: Master's thesis CA: scientific report, (presentation of results 30 min. (seminar and discussion))**	1
Total SWS:				6 <sup>+</sup>	5 <sup>+</sup>	0 <sup>+</sup>	1 <sup>+</sup>							
Total ECTS:								120	30 <sup>++</sup>	30 <sup>++</sup>	30 <sup>++</sup>	30		

\* The specific form of the examination depends on the type of course offered and chosen and is specified in the module handbook.

\*\* Unless otherwise specified, course achievements in tutorials are partial elements of the examination which are completed during the semester, are ungraded, and can be repeated an unlimited number of times.

+ Total SWS depend on the chosen elective module.

++ Deviations of +/- 2.5 per semester are possible, dependent on the choice of compulsory elective modules. Exactly 120 ECTS credits are accredited upon completion of the degree programme, but voluntary surplus modules are included in the transcript of records. If an elective module has more ECTS credits than required, the module grade contributes to the Master's degree according to the required credit weight.

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Erlangen, 22 July 2015

Prof. Dr.-Ing. Joachim Hornegger  
President

These regulations were established on 22 July 2015 at the University of Erlangen-Nürnberg and displayed for public inspection at the University of Erlangen-Nürnberg on 22 July 2015. The date of publication is 22 July 2015.