Study plan for the Master's degree programme Integrated Life Science

	Code	Title	Course	spezification exam /ungraded task	Exam number
Module group 1: Mathematical Modeling and Systems Biology					
mandatory modules	ILS-MA-M1	**Introduction to Statistics and Statistical Programming**	Introduction to Statistics	Portfolio exam: PL: written exam 90 min. (V) SL: weekly exercises (Ü)	80711 80712
			Tutorial for Introduction to Statistics (Problem Session)		
			Lab class Statistical Programming		
	ILS-MA-M2	**Biomathematics**	Biomathematics	Portfolio exam: PL: oral exam 30 min. or 90 min. written exam (V) SL: Paper- and Computer exercises (Ü)	80911
			Tutorial for Biomathematics		
	ILS-MA-B1	**Systems Biology**	Systems Biology	PL: written exam 60 min.	81011
			Laboratory Course Systems Biology		
mandatory elective modules	ILS-MA-I3	**Metabolic Networks II**	Metabolic Networks II	PL: oral exam 30 min. (V)	81311
			Exercises for Metabolic Networks II		
	ILS-MA-I4	**Spatial Modeling of Metabolic Processes**	Spatial Modelling of Metabolic Processes	Portfolio exam: PL: written exam 90 min. (V) SL: exercise sheets (Ü)	81411
			Tutorial for Spatial Modelling of Metabolic Processes		
			Laboratory coures for Spatial Modelling of Metabolic Processes		
	ILS-MA-M3	**Introduction to Mathematical Modeling**	Introduction to Mathematical Modeling	Portfolio exam: PL: oral exam 20 min. (V)	81611
			Tutorial/project for Introduction to Mathematical Modeling	PL: oral presentation 20 min. PL: protocol 20 p.(Ü)	
	ILS-MA-M4	**Partial Differential Equations for Life Sciences**	Partial Differential Equations for Life Sciences	Portfolio exam: PL: written exam 60 min. or oral exam 15 min. (V) SL: exercise sheets(Ü)	81811
			Tutorial for Partial Differential Equations for Life Sciences		

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ILS-MA-M6	**Mathematical Image Processing**	Mathematical Image Processing	PL: written exam 60 min. (V) or oral exam 20 min.	82411
		Tutorial for Mathematical Image Processing		
ILS-MA-M8	**Stochastic Models for Life Sciences**	Stochastic Models for Life Sciences	Portfolio exam: PL: oral exam 30 min. SL: weekly exercises(Ü)	81511
		Tutorial for Stochastic Models for Life Sciences		
ILS-MA-P1	**Complex Systems I**	Complex Systems I	PL: written exam 90 min. (V)	82011
		Tutorial for Complex Systems I		
ILS-MA-P2	**Complex Systems II**	Complex Systems II	PL: written exam 90 min. (V)	82111
		Tutorial for Complex Systems II		
ILS-MA-P3	**Complex Systems III**	Complex Systems III	PL: written exam 90 min. (V)	82161
		Tutorial for Complex Systems III		
ILS-MA-B5	**Developmental Biology 3: Computer simulations of embryonal pattern formation**	Laboratory course and seminar Computer simulations of embryonal pattern formation	Portfolio exam: PL: written exam 60 min PL: written protocol (Ü) SL: presentation 30 min. (S)	82211
ILS-MA-B11	**Bioanalytics**	Laboratory course and seminar Bioanalytics	Portfolio exam: PL: oral exam 30 min. (V/S) SL: written protocol , SL: presentation 30 min. (Ü)	22911
ILS-MA-B12	**Python Programming**	Practical: Introduction to Python Programming	Portfolio exam: SL:- hands-on exercises PL: programming project	83511
ILS-MA-B13	**Perl Programming for Biology**	Lecture: Perl Programming for Biology	PL: graded homework assignments	83711
		Computer lab: Perl Programming for Biology		
ILS-MA-B14	**Sequence Analysis and Statistical Genomics**	Lecture: Sequence Analysis and Statistical genomics	PL: graded homework assignments	83801
		Computer lab: Sequence Analysis and Statistical genomics		

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Module group 2: Bioimaging and Biophysics					
mandatory modules	ILS-MA-M1	**Introduction to Statistics and Statistical Programming**	Introduction to Statistics	Portfolio exam: PL: written exam 90 min. (V) SL: weekly exercises(Ü)	80711 80712
			Tutorial for Introduction to Statistics (Problem Session)		
			Lab class Statistical Programming		
	ILS-MA-I1A	**Bioimaging & Biophysics A**	Bioimaging & Biophysics A	PL: written exam 90 min. or oral exam 30 min. SL: protocols ungraded task	81111
			Laboratory course Bioimaging & Biophysics A		
	ILS-MA-I1B	**Bioimaging & Biophysics B**	Bioimaging & Biophysics B	PL: written exam 90 min. or oral exam 30 min.	81121
			Laboratory course Bioimaging & Biophysics B		
mandatory elective modules	ILS-MA-M6	**Mathematical Image Processing**	Mathematical Image Processing	PL: written exam 60 min. or oral exam 20 min.	82411
			Tutorial for Mathematical Image Processing		
	ILS-MA-P4	**Modern Optics: Advanced Optics**	Modern Optics: Advanced Optics	PL: written exam 120 min.	83111
			Tutorial for Modern Optics: Advanced Optics		
	ILS-MA-P5	**Experimental Physics 3: Optics and Quantum Phenomena**	Experimental Physics 3: Optics and Quantum Phenomena	PL: oral exam 30 min.	61221
			Tutorial for Experimental Physics 3: Optics and Quantum Phenomena		
	ILS-MA-P9	**Biological Physics**	Lecture: Biological Physics	PL: written exam 90 min.	?
			Tutorial: Biological Physics		
	ILS-MA-B9	**Molecular Neurophysiology**	Laboratory course and seminar Molecular Neurophysiology	Portfolio exam : PL: oral exam 30 Min. (V/S), PL: written protocols SL: presentation 30 Min. (Ü)	33011
	ILS-MA-B10	**Methods of Modern (Confocal-) Light Microscopy**	Laboratory course and seminar Methods of Modern (Confocal-) Light Microscopy	Portfolio exam : PL: written exam 60 min. SL: oral presentation 30 Min. (Ü)	83311
	ILS-MA-B12	**Python Programming**	Practical: Introduction to Python Programming	Portfolio exam: SL:- hands-on exercises PL: programming project	83511

Code	Title	Course	spezification exam /ungraded task	Exam number
		Module group 3: Biological Structures and Processes		

	Code	Title	Course	spezification exam /ungraded task	Exam number
mandatory modules	ILS-MA-M1	**Introduction to Statistics and Statistical Programming**	Introduction to Statistics	Portfolio exam : PL: written exam 90 min. SL: weekly exercises (Ü)	80711 80712
			Tutorial for Introduction to Statistics (Problem Session)		
			Lab class Statistical Programming		
	ILS-MA-I2A	**Interactions of Biological Macromolecules A**	Interactions of Biological Macromolecules A	Portfolio exam : PL: written exam 120 min. SL: exercise sheets	81211
			Seminar/Tutorial for Interactions of Biological Macromolecules A		
	ILS-MA-I2B	**Interactions of Biological Macromolecules B**	Interactions of Biological Macromolecules B	Portfolio exam : PL: written exam 120 min. SL: exercise sheets	81221
			Seminar/Tutorial for Interactions of Biological Macromolecules B		
mandatory elective modules	ILS-MA-P6	**Introduction to X-ray and Neutron Scattering I**	Elastic Scattering	PL: written exam 60 Min. or oral exam 30 Min. (V/Ü)	82511
			Tutorial for Elastic Scattering		
	ILS-MA-P7	**Introduction to X-ray and Neutron Scattering II**	Inelastic Scattering	PL: written exam 60 Min. or oral exam 30 Min.(V/Ü)	82611
			Tutorial for Inelastic Scattering		
	ILS-MA-P8	**Soft Matter and Biological Physics**	Physics of Soft and Biological Matter	PL: written exam 90 Min. (V/Ü)	82711
	ILS-MA-P9	**Biological Physics**	Lecture: Biological Physics	PL: written exam 90 min.	?
			Tutorial: Biological Physics		
	ILS-MA-B2	**Ion Transport and Signal Transduction**	Ion Transport and Signal Transduction	Portfolio exam : PL: written exam 60 min or oral exam30 min.(V/S) SL: oral presentation 30 min. (Ü)	83011
	ILS-MA-B3	**Developmental Biology 1: Pattern Formation, Growth, and Evolution**	Laboratory course and seminar Developmental Biology 1: Pattern Formation, Growth, and Evolution	Portfolio exam : PL: oral exam 30 min. (S) PL: written protocol, SL: presentation 30 min. (Ü)	20711
	ILS-MA-B4	**Developmental Biology 2: Molecular Control of Stem Cell and Organ Differentiation**	Laboratory course and seminar Developmental Biology 2: Molecular Control of Stem Cell and Organ Differentiation	Portfolio exam : PL: oral exam 30 min. (S) PL: written protocol, SL: presentation 30 min. (Ü	22411
	ILS-MA-B6	**Developmental Biology 4: Cell Migration and Morphogenesis**	Laboratory course and seminar Developmental Biology 4: Cell Migration and Morphogenesis	Portfolio exam : PL: oral exam 30 min. (S) PL: written protocol, SL: presentation 30 min. (Ü)	82811

	Code	Title	Course	Portfolio exam	
	ILS-MA-B7	**Structural Biology 1:** **Protein Design and Designer Proteins**	Laboratory Course and seminar Structural Biology 1: Protein Design and Designer Proteins	Portfolio exam : PL: written exam 60 Min. (V/S) PL: written protocol, PL: presentation 30 Min.	22011
	ILS-MA-B8	**Structural Biology 2:** **Structure and Function Relationships in Biological Macromolecules**	Laboratory course and seminar Structural Biology2: Structure and function relationships in biological macromolecules	Portfolio exam : PL: written exam 60 Min. (V/S) PL: written protocol, PL: presentation 30 Min.	22111
	ILS-MA-B12	**Python Programming**	Practical: Introduction to Python Programming	Portfolio exam: SL:- hands-on exercises PL: programming project	83511

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Speciali-zation	ILS-MA-VM	**Advanced Module**	Lecture, seminar, practical training in chosen subject	PL: oral exam 30 Min. (V/S/P)	80811
	ILS-MA-TH	**Master thesis**	Master thesis	PL: Master thesis , SL: scientific report , (presentation of results 30 min, seminar and discussion)	-