

Charles University
Faculty of Science

Study Plans

2024/2025

UNIVERSITAS
CAROLINA



Symbols listed in the study plans:

SZ1, SZ2, ... parts of the state examination

Indications for individual subjects:

[D] length of the course in days per semester

[H] length of the course in days per semester

[T] scope of the course in weeks per semester

[+3D] extra teaching (in addition to the above), here 3 days per semester

P the course has a prerequisite

K the subject has a corequisite

Z the subject has interchangeability

N the subject has an incompatibility

O the subject matter is repeatable

!! the course is not taught in the academic year 2024/2025

ob rok the course is taught every two years

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8. English study programs

8.1. Study program Ecology

Guarantor of the study program: prof. Mgr. Lukáš Kratochvíl, Ph.D.

Study specializations:

- Terrestrial Ecology
- Aquatic Ecology

Recommended study plan

A. Parts of the state examination are listed for individual specializations

B. The total amount of credits for general obligatory courses: **74**

C. The minimum amount of credits for general elective courses: **15**

D. Conditions for students to be able to take the two parts of the state examination

SZ1: MDIPL003 (Diploma thesis)

- complete successfully all the obligatory courses
- obtain the minimum amount of credits in all the groups of elective courses
- obtain the minimum of 120 credits.

SZ2: codes and title are listed for individual specializations

- complete successfully all the obligatory courses with the exception of MB162EKO4 (Diploma project IV)
- obtain the minimum amount of credits in all the groups of elective courses

General obligatory courses

Code	Subject	Amount	Cr.	Adv. Year.
MB162P48	Advanced ecology I.	W 3/0 Ex	4	1.
MB160S01	Ecological seminar 1A	W 0/2 C	1	1.
MB162EKO1	Diploma project I	W 0/0 C	10	1.
MB162P49	Advanced ecology II.	S 3/0 Ex	4	1.
MB162C06	Advanced Ecology — practical course	S 4/0[D] C	2	1.
MB162S03	Ecological seminar 1B	S 0/2 C	1	1.
MB162EKO2	Diploma project II	S 0/0 C	10	1.
MB162S04	Ecological seminar 2A	W 0/2 C	1	2.
MB162EKO3	Diploma project III	W 0/0 C	20	2.
MB162S05	Ecological seminar 2B	S 0/2 C	1	2.
MB162EKO4	Diploma project IV	S 0/0 C	20	2.
Obligatory courses			74	

General elective courses

Code	Subject	Amount	Cr.	Term
Block 1 – Statistical and bioinformatics courses				
MB120C15E	Flash R course ^N	0/4[D] C	2	W
MB120C16	Course of work with molecular data in R	0/5[D] C	2	W
MB120P147E	R for life ^N	1/1 C+Ex	2	W
MB170C47	UNIX and work with genomic data	0/3[D] C	2	W
MG440P44	Data analysis in R and Python	1/2 Ex	4	W
MB150P88E	The Basics of Bioinformatics ^N	2/2 Ex	5	S
Minimal credits: 6				
Block 2 – Journal Club				
MB162S13	Journal Club in Ecology 1	1/0 C	2	W
MB162S14	Journal Club in Ecology 2	1/0 C	2	W
MB162S15	Journal Club in Evolution 1	1/0 C	2	S
MB162S16	Journal Club in Evolution 2	1/0 C	2	S
Minimal credits: 4				
Block 3 – Terrain excursions and practices				
MB162T09	Ichthyological field course	0/4[D] C	3	S
MB120T64	Field course in botany	0/1[T] C	3	S
MB120T97E	Field excursion 'Vegetation of the central Europe'	0/1[T] C	2	S
MB170T22	Specialized field course in Zoology	1/0[T] Ex	3	S
MB170T57	Field Course in Ornithology	1/0[T] C	2	S
Minimal credits: 5				

Recommended option courses

Code	Subject	Amount	Cr.	Term
MB162P35	Basic bioacoustics ^{!!}	1/0 Ex	2	W
MB162S11	Vector graphics: a tool for science	0/3[D] C	2	W
MB162C05	Practical Course of Evolutionary Genetics and Genomics	0/5[D] C	4	W
MB120P132	Datahandling and numerical analyses in biostratigraphy	2/2 C+Ex	4	W
MB120P44	Use of molecular markers in plant systematics and population biol.	3/0 Ex	3	W
MB120C45E	Molecular markers in systematics and plant population biology II	0/1[T] C	3	S
MB170P62	Molecular Applications in Zoology ^N	2/0 Ex [+1D]	4	S

8.1.1. Specialization Terrestrial Ecology

Study advisor for the specialization: RNDr. Ondřej Sedláček, Ph.D.

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZBN023 (Terrestrial Ecology)

B. The total amount of credits for specialized obligatory courses: **0**

C. The minimum amount of credits for specialized elective courses: **19**

Specialized elective courses

Code	Subject	Amount	Cr.	Term
Block 1 – Systematically oriented courses				
MB160P06	Crustacean biology and diversity ^{ob rok}	2/0 Ex	3	S
MB162P40	Diversity of marine fishes	2/0 Ex	3	S
MB162P09	Ecology of Birds	2/0 C+Ex	3	S
MB162P39	Fish ecology	2/0 Ex	3	S
MB162P36	Insect ecology and conservation	3/0 Ex	4	S
MB120P184	Botany of non-vascular plants ^N	3/0 Ex	4	S
MB120C121	Botany of non-vascular plants — a practical course ^{KN}	0/2 C	2	S
MB120P166	Introduction to plant systematics, evolution and ecology	2/0 Ex	3	W,S
MB170P98	Diversity of Insects	2/0 Ex	3	W
MB160P66	Parasitology	2/0 Ex	3	W,S
Minimal credits: 9				
Block 2 – Evolutionary ecological courses				
MB162P24	Biological Invasions	2/0 Ex	3	W
MB120P113	Conservation Biology	3/0 Ex	4	S
MB162P11	Ecological Developmental Biology and Evolution of Phenotype	2/0 Ex	3	S
MB160P02	Ecology of lentic ecosystems ^{ob rok}	2/0 Ex	3	W
MB162P30	Ecology of the Cryosphere	2/0 Ex	3	S
MB162P27	Introduction to Polar Ecology	2/0 Ex	3	W
MB162P31	Stream Ecology ^N	2/0 Ex	3	W
MB120P22E	Methods in plant population biology	1/1 Ex	2	S
MB120P144	Plant breeding systems	2/2 C+Ex	3	S
MB120C14	Experimental plant ecology	1/2 C+Ex	4	S
MB120P165	Genomics of adaptation and speciation	2/2 C+Ex	4	S
MB120P172	Plant Epigenetics	2/4 C+Ex	4	W
MB120P94E	Population biology of plants	3/0 Ex	4	W
MB120P134	Quaternary palaeoecology	2/0 Ex	3	W
MB170P124	Basics of Evolutionary Biology ^N	2/0 Ex	3	W
MB170P106	Ethology and sociobiology	2/0 C+Ex [+1D]	5	W
MB170P84	Evolutionary and ecological immunology	3/0 C+Ex	4	W
MO550P126E	Limnology ^N	2/1 C+Ex	4	W
Minimal credits: 10				

8.1.2. Specialization Aquatic Ecology

Study advisor for the specialization: RNDr. Martin Černý, Ph.D.

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZBN022 (Ecology — Aquatic Ecology)

B. The total amount of credits for specialized obligatory courses: **0**

C. The minimum amount of credits for specialized elective courses: **19**

Specialized elective courses

Code	Subject	Amount	Cr.	Term
Block 1 – Systematically oriented courses				
MB160P06	Crustacean biology and diversity ^{ob rok}	2/0 Ex	3	S
MB160P11	Ecology of Cyanobacteria and Algae	2/0 Ex	3	W
MB162P39	Fish ecology	2/0 Ex	3	S
MB162P38	Diatomology	1/3[D] C	3	S
MB162P40	Diversity of marine fishes	2/0 Ex	3	S
MB120P184	Botany of non-vascular plants ^N	3/0 Ex	4	S
MB120C121	Botany of non-vascular plants — a practical course ^{K^N}	0/2 C	2	S
MB120P166	Introduction to plant systematics, evolution and ecology	2/0 Ex	3	W,S
MB120T119	Marine phycology course ^O	0/1[T] C	3	S
MB120P10	Phycology I	3/2 C+Ex	6	W
MB120P89	Phycology II	3/2 C+Ex	6	S
Minimal credits: 6				
Block 2 – Evolutionary ecological courses				
MB120P113	Conservation Biology	3/0 Ex	4	S
MB162P24	Biological Invasions	2/0 Ex	3	W
MB162P11	Ecological Developmental Biology and Evolution of Phenotype	2/0 Ex	3	S
MB160P02	Ecology of lentic ecosystems ^{ob rok}	2/0 Ex	3	W
MB162P30	Ecology of the Cryosphere	2/0 Ex	3	S
MB162P27	Introduction to Polar Ecology	2/0 Ex	3	W
MB162P31	Stream Ecology ^N	2/0 Ex	3	W
MB120C14	Experimental plant ecology	1/2 C+Ex	4	S
MB120P165	Genomics of adaptation and speciation	2/2 C+Ex	4	S
MB120P22E	Methods in plant population biology	1/1 Ex	2	S
MB120P144	Plant breeding systems	2/2 C+Ex	3	S
MB120P172	Plant Epigenetics	2/4 C+Ex	4	W
MB120P94E	Population biology of plants	3/0 Ex	4	W
MB120P134	Quaternary palaeoecology	2/0 Ex	3	W
MB170P124	Basics of Evolutionary Biology ^N	2/0 Ex	3	W
MO550P126E	Limnology ^N	2/1 C+Ex	4	W
Minimal credits: 13				

Credits for repeated completion of repeatable courses are not included in the sum of credits of elective courses.

8.2. Study program Immunology

Guarantor of the study program: prof. RNDr. Jan Černý, Ph.D.

Recommended study plan

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZBN044 (Immunology)

B. The total amount of credits for general obligatory courses: **101**

C. The minimum amount of credits for general elective courses: **6** (3 + 3)

D. Conditions for students to be able to take the two parts of the state examination

SZ1: MDIPL003 (Diploma thesis)

– complete successfully all the obligatory courses

– obtain the minimum amount of credits in all the groups of elective courses

– obtain the minimum of 120 credits.

SZ2: MSZBN044 (Immunology)

– complete successfully all the obligatory courses with the exception of MB100C4 (Diploma project IV)

– obtain the minimum amount of credits in all the groups of elective courses

General obligatory courses

Code	Subject	Amount	Cr.	Adv. Year.
MB150P77E	Histology ^N	S 3/0 Ex	4	1.
MB150P14E	Immunology ^N	W 2/0 Ex	3	1.
MB151C15E	Immunology — a Practical Course ^{KN}	W 0/1[T] C	3	1.
MB100C1	Diploma project I	W 0/0 C	10	1.
MB150S04	Seminar on Immunology	W 0/2 C	1	1.
MB100C2	Diploma project II	S 0/0 C	10	1.
MB150S13	Seminar on Immunology	S 0/2 C	1	1.
MB150P78A	Advances in Immunology ^{NO 1}	W/S 2/0 C	1	1.
MB150P78A	Advances in Immunology ^{NO 1}	W/S 2/0 C	1	1.
MB150P78A	Advances in Immunology ^{NO 1}	W/S 2/0 C	1	2.
MB151P108	Clinical Cases in Immunology	S 2/0 Ex	3	1. – 2.
MB151P140E	Functional Immunology	S 3/0 Ex	4	1. – 2.
MB151P132	Immunology of Infectious Diseases	W 2/0 Ex	3	2.
MB150P90E	Innate immunity	W 2/0 Ex	3	2.
MB100C3	Diploma project III	W 0/0 C	24	2.
MB150S14	Seminar on Immunology	W 0/2 C	1	2.
MB151P99E	Animal models in immunology	S 2/0 Ex	3	2.
MB100C4	Diploma project IV	S 0/0 C	24	2.
MB150S15	Seminar on Immunology	S 0/2 C	1	2.
Obligatory courses			101	

¹ The student completes a repeatedly enrollable subject at least three times during the study.

General elective courses

Code	Subject	Amount	Cr.	Term
Block 1 – General courses				
MB140P88E	General Microbiology	2/0 Ex	3	S
MB160P80E	General Parasitology: from Viruses to Animals	3/0 Ex	4	W
MB150P88E	The Basics of Bioinformatics ^N	2/2 Ex	5	S
Minimal credits: 3				
Block 2 – Immunology				
MB151P80E	Cytometry ^N	2/1 C+Ex	4	S
MB170P84	Evolutionary and ecological immunology	3/0 C+Ex	4	W
MB151P142E	Systems Immunology	2/1 C+Ex	4	S
MB160P75E	Parasite Immunology	2/0 Ex	3	W
Minimal credits: 3				

Recommended option courses

Code	Subject	Amount	Cr.	Term
Advances Molecular and cell biology				
MB150P85	Epigenetics	2/0 Ex	3	W
MB151P125	Molecules of Life & Mutations	2/3[D] Ex	3	S
MB150P09E	4EU+ Proteins of Signaling Cascades ^N	2/0 Ex	3	S
MB150P91E	RNA structure and function	2/0 Ex	3	S
MB151P139E	Signaling pathways in genetic disorders	2/0 Ex	3	W
Techniques				
MB100P07	Electron Microscopy Methods for Biology ^{!N ob rok}	0/2 C	2	S
MB120C15E	Flash R course ^N	0/4[D] C	2	W
MB151P130	Genomics — Approaches and Algorithms	2/2 C+Ex	5	W
MB150C27E	Histology — a Practical Course ^N	0/2[D] C	1	S
MB140P86	Methods of functional genomics	4/0[D] Ex	3	S
MB150P120E	Molecular mechanisms of regulated cell death	2/0 Ex	3	W
MB140C35	Practical molecular biology	0/1[T] C	3	S
MB120P147E	R for life ^N	1/1 C+Ex	2	W

8.3. Study program Parasitology and Infection Biology

Guarantor of the study program: doc. RNDr. Jan Votýpka, Ph.D.

Recommended study plan

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZBN051 (Parasitology and Infection Biology)

B. The total amount of credits for general obligatory courses: **147**

C. The minimum amount of credits for general elective courses: **10**

D. Conditions for students to be able to take the two parts of the state examination

SZ1: MDIPL003 (Diploma thesis)

– complete successfully all the obligatory courses

– obtain the minimum amount of credits in all the groups of elective courses

– obtain the minimum of 180 credits.

SZ2: MSZBN051 (Parasitology and Infection Biology)

– complete successfully all the obligatory courses with the exception of MB100I4 (Diploma Project PIB IV^{!!})

– obtain the minimum amount of credits in all the groups of elective courses

General obligatory courses

Code	Subject	Amount	Cr.	Adv. Year.
MB151P123E	Cell Biology and Biochemistry	W 3/0 Ex	4	1.
MB140P71E	Essentials of Molecular Biology	S 3/0 Ex	4	1.
MB140P16E	Principles of Genetics	W 2/2 C+Ex	5	1.
MB150P14E	Immunology ^N	W 2/0 Ex	3	1.
MB151C15E	Immunology — a Practical Course ^{KN}	W 0/1[T] C	3	1.
MB150P77E	Histology ^N	S 3/0 Ex	4	1.
MB150C27E	Histology — a Practical Course ^N	S 0/2[D] C	1	1.
MB160P80E	General Parasitology: from Viruses to Animals	W 3/0 Ex	4	1.
MB160C25E	Introduction to Parasitology: a Practical Course	W 0/2 C	2	1.
MB140S50E	Advances in Infection Biology I	W 0/2 C	2	1.
MB160P77E	Biology of Parasitic Protists	S 2/0 Ex	3	1.
MB160C77E	Biology of Parasitic Protists: a Practical Course	S 0/2 C	2	1.
MB140P88E	General Microbiology	S 2/0 Ex	3	1.
MB140P81E	Molecular Virology: Virus Replication Strategies	W 3/0 Ex	4	1.
MB160C45E	Microscopic Techniques	W 0/20[H] C	2	1.

MB160C84E	Laboratory Methods: a Practical Course	S 0/3 C	3	1.
MB140S53E	Advances in Infection Biology Ib	S 0/2 C	2	1.
MB140P12E	Genetics of Bacteria ^{!!}	W 2/1 C+Ex	4	2.
MB160P78E	Biology of Parasitic Helminths ^{!!}	W 2/0 Ex	3	2.
MB160C78E	Biology of Parasitic Helminths: a Practical Course ^{!!}	W 0/2 C	2	2.
MB160P76E	Medical Entomology ^{!!}	S 2/0 Ex	3	2.
MB160C76E	Medical Entomology: a Practical Course ^{!!}	S 0/2 C	2	2.
MB140P76E	Medical Microbiology 1 ^{!!}	S 2/2 C [+1T]	5	2.
MB140P91	Molecular and Immunologic Mechanism of Viral Pathogenesis	W 2/0 Ex	3	2.
MB140C69E	Practical Course of Diagnostic Methods in Virology ^N	W 0/1[T] MC	3	2.
MB150P88E	The Basics of Bioinformatics ^N	S 2/2 Ex	5	2.
MZ340E17	GIS in Epidemiology ^{!!}	S 1/2 C	3	2.
MS710P65	Biostatistics ^N	S 2/2 C+Ex	5	2.
MB140S51E	Advances in Infection Biology II ^{!!}	W 0/2 C S 0/2 C	4	2.
MB100I1	Diploma Project PIB I ^{!!}	W 0/0 C	2	2.
MB100I2	Diploma Project PIB II ^{!!}	S 0/0 C	4	2.
MB160P75E	Parasite Immunology	W 2/0 Ex	3	3.
MB140P77E	Medical Microbiology 2 ^{!!}	W 2/2 C+Ex [+1T]	5	3.
MB140P31E	Fungal Pathogens and Interaction with their Hosts	S 2/0 Ex	3	3.
MB160P85E	Pathology of Parasitic Diseases ^{!!}	W 2/2 C+Ex	5	3.
MB160P81E	Molecular Biology and Biochemistry of Parasites ^{!!}	S 2/2 C+Ex	5	3.
MB160P83E	Diagnosis and Therapy of Infectious Diseases ^{!!}	W 3/1 C+Ex	5	3.
MB160P82E	Epidemiology of Infectious Diseases ^{!!}	W 2/0 Ex	3	3.
MB140P85E	Pathogenesis, Epidemiology and Diagnostics of Selected Human Viral Diseases ^{!!}	S 2/0 Ex	3	3.
MB140P80E	Vaccinology ^{!!}	W 1/0 Ex	2	3.
MB140S52E	Advances in Infection Biology III ^{!!}	W 0/2 C S 0/2 C	4	3.
MB100I3	Diploma Project PIB III ^{!!}	W 0/0 C	5	3.
MB100I4	Diploma Project PIB IV ^{!!}	S 0/0 C	5	3.
Obligatory courses			147	

General elective courses

Code	Subject	Amount	Cr.	Adv. Year.
Block 1 – General courses				
MB150P90E	Innate immunity	W 2/0 Ex	3	2.
MB170P84	Evolutionary and ecological immunology	W 3/0 C+Ex	4	1.
MB160C67	Practical course in molecular parasitology ^N	S 0/2[T] C	4	2.
MB160T40	Field Course in Fish Parasitology for Erasmus Students	W 0/1[D] C	1	1.
MB160T69	Field course in fish parasitology I [!] ob rok	S 0/10[D] C	4	3.
MB160T67	Field parasitology I ^{!K} ob rok	S 0/10[D] C	4	2.
MB150C31	Practical course in animal and human physiology ^N	W/S 0/1[T] C	3	3.
MB161P46	Biology of Parasitism: Summer School ^N	S 0/10[D] C	5	2.
Minimal credits: 10				

8.4. Study program Botany

Guarantor of the study program: doc. RNDr. Petr Sklenář, Ph.D.

Study specializations:

- Phycology and Algal Ecology
- Bryology and Lichenology
- Mycology
- Plant Ecology
- Vascular Plants

Recommended study plan

A. Parts of the state examination are listed for individual specializations

B. The total amount of credits for general obligatory courses: **72**

C. The minimum amount of credits for general elective courses: **0**

D. Conditions for students to be able to take the two parts of the state examination

SZ1: MDIPL003 (Diploma thesis)

- complete successfully all the obligatory courses
- obtain the minimum amount of credits in all the groups of elective courses
- obtain the minimum of 120 credits.

SZ2: codes and title are listed for individual specializations

- complete successfully all the obligatory courses with the exception of MB100C4 (Diploma project IV)
- obtain the minimum amount of credits in all the groups of elective courses

General obligatory courses

Code	Subject	Amount	Cr.	Adv. Year.
MB120S126E	Seminars in botany	W 0/2 C	1	1.
MB100C1	Diploma project I	W 0/0 C	10	1.
MB120S127E	Seminars in botany	S 0/2 C	1	1.
MB100C2	Diploma project II	S 0/0 C	10	1.
MB120S128E	Seminars in botany	W 0/2 C	1	2.
MB100C3	Diploma project III	W 0/0 C	24	2.
MB120S129E	Seminars in botany	S 0/2 C	1	2.
MB100C4	Diploma project IV	S 0/0 C	24	2.
Obligatory courses			72	

8.4.1. Specialization Phycology and Algal Ecology

Study advisor for the specialization: prof. RNDr. Jiří Neustupa, Ph.D.

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZBN002 (Botany — Phycology and Algal Ecology)

B. The total amount of credits for specialized obligatory courses: **20**

C. The minimum amount of credits for specialized elective courses: **16**

Specialized obligatory courses

Code	Subject	Amount	Cr.	Term
MB120P10	Phycology I	3/2 C+Ex	6	W
MB120P89	Phycology II	3/2 C+Ex	6	S
MB160P11	Ecology of Cyanobacteria and Algae	2/0 Ex	3	W
MB120P147E	R for life ^N	1/1 C+Ex	2	W
MB160P21	Molecular phylogenetics and systematics	2/0 Ex	3	W
Obligatory courses			20	

Specialized elective courses

Code	Subject	Amount	Cr.	Term
<i>MB120T13E</i>	<i>Phycological field excursion^O</i>	<i>0/1[T] C</i>	<i>3</i>	<i>S</i>
<i>MB120P29E</i>	<i>Lichenology</i>	<i>2/2 C+Ex</i>	<i>5</i>	<i>S</i>
<i>MB120P83E</i>	<i>Methods of phylogenetics</i>	<i>2/1 C+Ex</i>	<i>4</i>	<i>S</i>
<i>MB120P44</i>	<i>Use of molecular markers in plant systematics and population biol.</i>	<i>3/0 Ex</i>	<i>3</i>	<i>W</i>
<i>MB120P126E</i>	<i>Multivariate methods in taxonomy</i>	<i>2/1 C+Ex</i>	<i>4</i>	<i>W</i>
<i>MB120P59E</i>	<i>Algological determination practice^O</i>	<i>0/2 C</i>	<i>2</i>	<i>S</i>
<i>MB120P66E</i>	<i>Botanical nomenclature</i>	<i>2/2 C+Ex</i>	<i>5</i>	<i>S</i>
<i>MB160P63</i>	<i>General protistology</i>	<i>2/0 Ex</i>	<i>3</i>	<i>S</i>
<i>MB120C117</i>	<i>Target enrichment for plant systematics — methodological workshop</i>	<i>0/8[D] C</i>	<i>5</i>	<i>S</i>

<i>MB120C45E</i>	<i>Molecular markers in systematics and plant population biology II</i>	<i>0/1[T] C</i>	<i>3</i>	<i>S</i>
<i>MB120T97E</i>	<i>Field excursion 'Vegetation of the central Europe'</i>	<i>0/1[T] C</i>	<i>2</i>	<i>S</i>
<i>MB120P102E</i>	<i>Biostatistics II</i>	<i>1/1 Ex</i>	<i>2</i>	<i>W</i>
<i>MB120T09E</i>	<i>Course in winter ecology</i>	<i>2/0 C+Ex [+1T]4</i>		<i>W</i>
Minimal credits: 16				

Credits for repeated completion of repeatable courses are not included in the sum of credits of elective courses.

8.4.2. Specialization Bryology and Lichenology

Study advisor for the specialization: RNDr. David Svoboda, Ph.D.

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZBN003 (Botany — Bryology and Lichenology)

B. The total amount of credits for specialized obligatory courses: **20**

C. The minimum amount of credits for specialized elective courses: **16**

Specialized obligatory courses

Code	Subject	Amount	Cr.	Term
MB120S03E	Diploma thesis seminar (cryptogamology) I ^O	0/1 C	1	W
MB120S04E	Diploma thesis seminar (cryptogamology) II ^O	0/1 C	1	S
MB120P64E	Ecology of bryophytes and lichens	2/0 Ex	3	W
MB120P187E	Bryology	3/2 C+Ex	6	S
MB120P152E	Biology of lichens	2/1 C+Ex	4	W
MB120P29E	Lichenology	2/2 C+Ex	5	S
Obligatory courses			20	

Specialized elective courses

Code	Subject	Amount	Cr.	Term
<i>MB120S17E</i>	<i>Journal club in lichenology I^O</i>	<i>0/1 C</i>	<i>1</i>	<i>W,S</i>
<i>MB120P30E</i>	<i>The selected chapters of lichenology I</i>	<i>1/0 Ex</i>	<i>1</i>	<i>S</i>
<i>MB120P36E</i>	<i>The selected chapters of lichenology II</i>	<i>1/0 Ex</i>	<i>1</i>	<i>W</i>
<i>MB120P46E</i>	<i>General mycology^{ob rok}</i>	<i>3/0 Ex</i>	<i>4</i>	<i>W</i>
<i>MB120P90E</i>	<i>Systematic mycology II</i>	<i>3/2 C+Ex</i>	<i>6</i>	<i>S</i>
<i>MB120T52E</i>	<i>Cryptogamic special excursion^O</i>	<i>0/1[T] C</i>	<i>3</i>	<i>S</i>
<i>MB160P11</i>	<i>Ecology of Cyanobacteria and Algae</i>	<i>2/0 Ex</i>	<i>3</i>	<i>W</i>
<i>MB120P147E</i>	<i>R for life^N</i>	<i>1/1 C+Ex</i>	<i>2</i>	<i>W</i>
<i>MB120P14E</i>	<i>Vegetation of Central Europe I</i>	<i>2/0 C</i>	<i>3</i>	<i>S</i>
<i>MB120P86E</i>	<i>Vegetation of Central Europe II</i>	<i>2/0 C+Ex</i>	<i>3</i>	<i>W</i>
<i>MB120P44</i>	<i>Use of molecular markers in plant systematics and population biol.</i>	<i>3/0 Ex</i>	<i>3</i>	<i>W</i>

MB120C96E	<i>Principles of GIS and their application in botany</i>	1/2 C+Ex	4	W
MB120P188	<i>Introduction to data analysis in ecology</i>	2/3 C+Ex	5	W
MB120P83E	<i>Methods of phylogenetics</i>	2/1 C+Ex	4	S
MB120P89	<i>Phycology II</i>	3/2 C+Ex	6	S
MB120T06E	<i>Field excursions in the surrounding of Prague</i>	0/5[D] C	1	S
MB120T02E	<i>Lichenological field excursion^O</i>	0/1[T] C	3	S
MB120T01E	<i>Bryological field excursion^O</i>	0/1[T] C	3	S

Minimal credits: 16

Credits for repeated completion of repeatable courses are not included in the sum of credits of elective courses.

8.4.3. Specialization Mycology

Study advisor for the specialization: doc. Mgr. Ondřej Koukol, Ph.D.

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZBN004 (Botany — Mycology)

B. The total amount of credits for specialized obligatory courses: **20**

C. The minimum amount of credits for specialized elective courses: **16**

Specialized obligatory courses

Code	Subject	Amount	Cr.	Term
MB120S03E	Diploma thesis seminar (cryptogamology) I ^O	0/1 C	1	W
MB120P47E	Systematic mycology I	3/2 C+Ex	6	W
MB120P90E	Systematic mycology II	3/2 C+Ex	6	S
MB120P44	Use of molecular markers in plant systematics and population biol.	3/0 Ex	3	W
MB120T120	Advanced course in Mycology ^O	1/1 C	4	S
Obligatory courses			20	

Specialized elective courses

Code	Subject	Amount	Cr.	Term
MB120P147E	<i>R for life^N</i>	1/1 C+Ex	2	W
MB120P10	<i>Phycology I</i>	3/2 C+Ex	6	W
MB120P102E	<i>Biostatistics II</i>	1/1 Ex	2	W
MB120P152E	<i>Biology of lichens</i>	2/1 C+Ex	4	W
MB120P188	<i>Introduction to data analysis in ecology</i>	2/3 C+Ex	5	W
MB120P29E	<i>Lichenology</i>	2/2 C+Ex	5	S
MB120P30E	<i>The selected chapters of lichenology I</i>	1/0 Ex	1	S
MB120P36E	<i>The selected chapters of lichenology II</i>	1/0 Ex	1	W

<i>MB120P64E</i>	<i>Ecology of bryophytes and lichens</i>	<i>2/0 Ex</i>	<i>3</i>	<i>W</i>
<i>MB120P187E</i>	<i>Bryology</i>	<i>3/2 C+Ex</i>	<i>6</i>	<i>S</i>
<i>MB130P94E</i>	<i>Mycorrhizal symbiosis^{N ob rok}</i>	<i>2/0 C+Ex [+1D]</i>	<i>4</i>	<i>S</i>
<i>MB120P46E</i>	<i>General mycology^{ob rok}</i>	<i>3/0 Ex</i>	<i>4</i>	<i>W</i>
<i>MB120C77AE</i>	<i>Working methods in phycology</i>	<i>0/2 C</i>	<i>2</i>	<i>W</i>
<i>MB120P83E</i>	<i>Methods of phylogenetics</i>	<i>2/1 C+Ex</i>	<i>4</i>	<i>S</i>
Minimal credits: 16				

8.4.4. Specialization Plant Ecology

Study advisor for the specialization: doc. RNDr. Petr Sklenář, PhD.

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZBN005 (Botany — Plant Ecology)

B. The total amount of credits for specialized obligatory courses: **20**

C. The minimum amount of credits for specialized elective courses: **16**

Specialized obligatory courses

Code	Subject	Amount	Cr.	Term
MB120P100E	Geobotany (Introduction to ecological botany)	2/0 Ex	3	W
MB120P94E	Population biology of plants	3/0 Ex	4	W
MB120S96AE	Diploma thesis seminar (geobotany) I	0/2 C	1	W
MB120S96BE	Diploma thesis seminar (geobotany) II	0/2 C	1	S
MB120T109E	Field methods in plant ecology and phytosociology	0/1[T] C	2	S
MB120P07E	Biomes of the Earth	2/1 Ex	4	W
MB120C14	Experimental plant ecology	1/2 C+Ex	4	S
MB120T06E	Field excursions in the surrounding of Prague	0/5[D] C	1	S
Obligatory courses			20	

Specialized elective courses

Code	Subject	Amount	Cr.	Term
Block 1 – Ecology				
<i>MB120P21</i>	<i>Practical class in Quaternary Palaeoecology</i>	<i>0/3 C</i>	<i>3</i>	<i>W</i>
<i>MB120P180</i>	<i>Clonal plants</i>	<i>2/2 C+Ex</i>	<i>4</i>	<i>S</i>
<i>MB120P151E</i>	<i>Plant Ecology I^P</i>	<i>2/0 C+Ex [+1T]</i>	<i>3</i>	<i>W</i>
<i>MB120P14E</i>	<i>Vegetation of Central Europe I</i>	<i>2/0 C</i>	<i>3</i>	<i>S</i>
<i>MB120P86E</i>	<i>Vegetation of Central Europe II</i>	<i>2/0 C+Ex</i>	<i>3</i>	<i>W</i>
Minimal credits: 10				
Block 2 – Statistics, methods				
<i>MB120C96E</i>	<i>Principles of GIS and their application in botany</i>	<i>1/2 C+Ex</i>	<i>4</i>	<i>W</i>

MB120P147E	<i>R for life^N</i>	1/1 C+Ex	2	W
MB120P188	<i>Introduction to data analysis in ecology</i>	2/3 C+Ex	5	W
MB120T28E	<i>Flora of central Europe — field excursion</i>	0/1[T] C	2	S
MB120T97E	<i>Field excursion 'Vegetation of the central Europe'</i>	0/1[T] C	2	S
MB162P49	<i>Advanced ecology II.</i>	3/0 Ex	4	S
Minimal credits: 6				

8.4.5. Specialization Vascular Plants

Study advisor for the specialization: Mgr. Tomáš Fér, Ph.D.

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZBN006 (Botany — Vascular Plants)

B. The total amount of credits for specialized obligatory courses: **20**

C. The minimum amount of credits for specialized elective courses: **16**

Specialized obligatory courses

Code	Subject	Amount	Cr.	Term
MB120S01E	Diploma thesis seminar (vascular plants) I ^O	0/2 C	1	W
MB120S02E	Diploma thesis seminar (vascular plants) II ^O	0/2 C	1	S
MB120P83E	Methods of phylogenetics	2/1 C+Ex	4	S
MB120P144	Plant breeding systems	2/2 C+Ex	3	S
MB120P153E	Introduction to study of plant evolution and diversity	2/1 C+Ex	3	W
MB120P167E	Biosystematics I	2/0 Ex	2	W
MB120T61E	Field course in botany	0/1[T] C	3	S
MB120P166	Introduction to plant systematics, evolution and ecology	2/0 Ex	3	W,S
Obligatory courses			20	

Specialized elective courses

Code	Subject	Amount	Cr.	Term
Block 1 – Evolution				
MB120P165	<i>Genomics of adaptation and speciation</i>	2/2 C+Ex	4	S
MB120P53E	<i>Polyploid speciation^{ob rok}</i>	2/0 Ex	3	W
MB120P172	<i>Plant Epigenetics</i>	2/4 C+Ex	4	W
MB120P186	<i>Transposable elements: from junk DNA toad to Prince Major Driver of biodiversity</i>	2/2 C+Ex	6	W

<i>MB120T28E</i>	<i>Flora of central Europe — field excursion</i>	<i>0/1[T] C</i>	<i>2</i>	<i>S</i>
<i>MB120P168E</i>	<i>Biosystematics II</i>	<i>2/0 Ex</i>	<i>2</i>	<i>S</i>
Minimal credits: 8				
Block 2 – Methods				
<i>MB120C51</i>	<i>Practical course of karyological and palynological methods</i>	<i>0/1 C</i>	<i>4</i>	<i>W</i>
<i>MB120P143E</i>	<i>Advanced methods in DNA sequence and multilocus data analyses</i>	<i>1/2 C+Ex</i>	<i>3</i>	<i>W</i>
<i>MB120P126E</i>	<i>Multivariate methods in taxonomy</i>	<i>2/1 C+Ex</i>	<i>4</i>	<i>W</i>
<i>MB120P188</i>	<i>Introduction to data analysis in ecology</i>	<i>2/3 C+Ex</i>	<i>5</i>	<i>W</i>
<i>MB120C16</i>	<i>Course of work with molecular data in R</i>	<i>0/5[D] C</i>	<i>2</i>	<i>W</i>
<i>MB120C23</i>	<i>Course of work in Linux command line not only for MetaCentrum</i>	<i>0/4[D] C</i>	<i>2</i>	<i>W</i>
<i>MB120C117</i>	<i>Target enrichment for plant systematics — methodological workshop</i>	<i>0/8[D] C</i>	<i>5</i>	<i>S</i>
<i>MB120P147E</i>	<i>R for life^N</i>	<i>1/1 C+Ex</i>	<i>2</i>	<i>W</i>
<i>MB120P44</i>	<i>Use of molecular markers in plant systematics and population biol.</i>	<i>3/0 Ex</i>	<i>3</i>	<i>W</i>
<i>MB120C44E</i>	<i>Molecular markers in systematics and plant population biology</i>	<i>0/1[T] C</i>	<i>3</i>	<i>W</i>
<i>MB120C45E</i>	<i>Molecular markers in systematics and plant population biology II</i>	<i>0/1[T] C</i>	<i>3</i>	<i>S</i>
Minimal credits: 8				

8.5. Study program Demography

Guarantor of the study program: doc. RNDr. Jiřina Kocourková, PhD.

Recommended study plan

A. Parts of the state examination (topics are listed in SIS)

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZD009 (Demography^P)

B. The total amount of credits for general obligatory courses: **69**

C. The minimum amount of credits for general elective courses: **28** (14 + 14)

D. Conditions for students to be able to take the two parts of the state examination

SZ1: MDIPL003 (Diploma thesis)

– complete successfully all the obligatory courses

– obtain the minimum amount of credits in all the groups of elective courses

– obtain the minimum of 120 credits.

SZ2: MSZD009 (Demography^P)

- complete successfully all the obligatory courses
- obtain the minimum amount of credits in all the groups of elective courses
- obtain the minimum of 120 credits
- fulfil course MDIPL003 (Diploma thesis)

General obligatory courses

Code	Subject	Amount	Cr.	Adv. Year.
MD360E01	Demographic Analysis I	W 3/2 C+Ex	8	1.
MD360E03	Population Theory	W 0/2 C	3	1.
MD360E02	Demographic Analysis II	S 2/2 C+Ex	8	1.
MD360DP5	Diploma Project	W/S 0/6 C	10	1.
MD360E04	Population Policy	W 2/1 C+Ex	4	2.
MD360P94	Population Projections and Forecasts	W 2/2 C+Ex	6	2.
MD360DP6	Diploma Project	W/S 0/6 C	10	2.
MD360DP7	Diploma Project	W/S 0/8 C	20	2.
Obligatory courses			69	

General elective courses

Code	Subject	Amount	Cr.	Term
Block 1 – Methodological subjects				
<i>MZ340A03</i>	<i>Analysis, mapping and visualization of urban and regional development</i>	<i>S 1/2 C+Ex</i>	5	1. - 2.
<i>MD360E10</i>	<i>Civil Registration and Social Statistics in Practice</i>	<i>W 0/1[T] C</i>	3	1. - 2.
<i>MD360P22</i>	<i>SAS Applications in Demography I</i>	<i>W 1/1 Ex</i>	3	1. - 2.
<i>MD360P29</i>	<i>SAS Applications in Demography II</i>	<i>S 1/2 Ex</i>	4	1. - 2.
<i>MD360E06</i>	<i>Applied Demography</i>	<i>S 2/2 C+Ex</i>	8	1. - 2.
Minimal credits: 14				
Block 2 – Thematic subjects				
<i>MD360P96</i>	<i>Global Population Challenges^{ob rok}</i>	<i>S 0/1 Ex</i>	4	1. - 2.
<i>MD360E07</i>	<i>Demographic Excursion</i>	<i>S 0/1[T] C</i>	3	1.
<i>MD360P97</i>	<i>Social Inequalities in Health</i>	<i>S 0/1 Ex</i>	4	1. - 2.
<i>MD360P60</i>	<i>Regional demography and demography of regions</i>	<i>S 2/2 C+Ex</i>	5	1. - 2.
<i>MD360E08</i>	<i>Demographic Ageing</i>	<i>W 2/1 C</i>	3	2.
<i>MZ340A02</i>	<i>Resilient Cities: Challenges, Risks and Response</i>	<i>S 2/1 C+Ex</i>	8	2.
Minimal credits: 14				

8.6. Study program Science

Guarantor of the study program: doc. RNDr. Filip Uhlík, Ph.D.

Recommended study plan

A. Parts of the state examination (topics are listed in SIS)

SZ1: MDIPL002 (Bachelor's thesis)

SZ2: MSZSCI01 (Science^P)

B. The total amount of credits for general obligatory courses: **122**

C. The minimum amount of credits for general elective courses: **33** (18 + 15)

D. Conditions for students to be able to take the two parts of the state examination

SZ1: MDIPL002 (Bachelor's thesis)

– complete successfully both parts of the Bachelor project

– obtain the minimum of 150 credits.

SZ2: MSZSCI01 (Science^P)

– complete successfully all obligatory courses

– obtain the minimum amount of credits in all the groups of elective courses

– obtain the minimum of 180 credits

– complete obligation MDIPL002 (Bachelor's thesis)

General obligatory courses

Code	Subject	Amount	Cr.	Adv. Year.
MC260P144	Chemical principles	W 2/3 C+Ex	5	1.
MB151P135E	From Molecules to Cells	W 3/2 C+Ex	5	1.
MC260S62	Seminar I	W 0/1 C	1	1.
NFPL028	Principles of Physics I – General Physics and Classical Mechanics	W 2/2 C+Ex	5	1.
NCHF071	Applied Mathematics I	W 3/3 C+Ex	6	1.
NSCI020	Mathematical methods in natural sciences	W 0/2 C	2	1.
NSCI030	Introduction to computational science	W 2/2 C+Ex	5	1.
MC260P145	Chemical transformations	S 2/2 C+Ex	5	1.
MB151P136E	From Cells to Organism	S 3/2 C+Ex	5	1.
MC260P148	Programming	S 2/1 C+Ex	4	1.
MB151S14E	Seminar II	S 0/1 C	1	1.
NFPL064	Principles of Physics II – Electromagnetism and Optics	S 2/2 C+Ex	5	1.
NCHF072	Applied Mathematics II	S 3/3 C+Ex	6	1.
NMAI059	Probability and Statistics 1 ^{ZN}	S 2/2 C+Ex	5	1.
MC260P146	Theoretical Methods in Chemistry	W 2/2 C+Ex	5	2.
MB162P44	On the Evolution and Ecology	W 3/2 C+Ex	5	2.
NBCM241	Principles of Physics III — Quantum Mechanics	W 2/2 C+Ex	5	2.
NFPL217	Experimental Methods in Physics	W 0/4 C [+4]	5	2.

NCHF073	Applied Mathematics III	W 2/2 C+Ex	5	2.
NFPL152	Seminar III	W 0/1 C	1	2.
NSCI050	Personal development	W 2/0 C	3	2.
MC260P147	Experimental Methods in Chemistry	S 2/2 C+Ex	5	2.
MB151P137E	Biological Techniques	S 3/2 C+Ex	5	2.
MC260C66	Chemistry Laboratory	S 0/4 C	5	2.
MB151C06E	Biology — Laboratory	S 0/4 C	5	2.
MC260S63	Seminar IV	S 0/1 C	1	2.
NSCI004	Principles of Physics IV — Electrodynamics	S 2/2 C+Ex	5	2.
NCHF074	Applied Mathematics IV	S 2/2 C+Ex	5	2.
MC260S64	Seminar V ^{!!}	W 0/1 C	1	3.
MC260S65	Seminar VI ^{!!}	S 0/1 C	1	3.
Obligatory courses			122	

The course NFPL065 (Personal development II^{!!}) was removed from the study plan of students starting in the academic year 2023/24.

Bachelor project

Code	Subject	Amount	Cr.	Adv. Year.
MC260DP6A	Bachelor's Project I - Chemistry ^{!! C}	W 0/3 C	3	3.
MC260DP6B	Bachelor's Project II — Chemistry ^{!!K C}	S 0/12 C	12	3.
MB100BP6E	Bachelor's Project I - Biology ^{!! B}	W 0/3 C	3	3.
MB100BP7E	Bachelor's Project II — Biology ^{!!K B}	S 0/12 C	12	3.
NFPL301	Bachelor's Project I - Physics ^{!! F}	W 0/3 C	3	3.
NFPL804	Bachelor's Project II — Physics ^{!!K F}	S 0/12 C	12	3.
Minimal credits: 15				

Students select a pair of Bachelor's projects with the same specialization C, B or F.

General elective courses

Code	Subject	Amount	Cr.	Adv. Year.
Thematic subjects				
MC260C30A	Advanced Practical Class in Physical and Macromolecular Chemistry ^N	S 0/4 C	5	3.
MC260P132	Physical Chemistry for International Students I	S 2/1 C+Ex	4	3.
MC260P133	Physical Chemistry for International Students II	W 2/1 C+Ex	4	3.
MC260P82	Electronic Structure of Complex Molecular Systems and Biomolecules ^N	W 2/2 Ex	5	3.

MC230C02N	Laboratory training in analytical chemistry	W 0/4 C	6	3.
MC230C15	Laboratory Course in Instrumental Analysis ^N	S 0/3 C	4	3.
MC230P09	Chemometrics	S 2/0 Ex	3	3.
MC230P21	Principles of Sampling	W 2/0 Ex	3	3.
MC230P32	Toxicology	S 2/0 Ex	2	3.
MC240P60	Crystallography Basic	W/S 2/0 Ex	2	3.
MC260P125	NMP Spectroscopy of condensed state	W 2/0 Ex	3	3.
MC260P127A	Scattering and Microscopy Methods ^{!!}	S 1/1 Ex	3	3.
MC260P128A	Spectroscopic methods — A	S 1/1 Ex	3	3.
NMAG469	Mathematical foundations of machine learning	W 2/0 Ex	3	3.
NEVF535	Nanomaterials I	W/S 2/0 Ex	3	3.
NFPL077	Methods for the study of solid-state materials and surfaces	W/S 2/0 Ex	3	3.
NFPL181	Solid State Physics	S 2/1 Ex	4	3.
NFPL159	Modern Materials with Application Potential	S 2/0 Ex	3	3.
NFPL215	Dielectric and Magnetic Properties of Matter	S 1/1 C+Ex	3	3.
NFPL168	Low Temperature Physics and Techniques	W 2/0 Ex	3	3.
NFPL139	Physics of Materials II	S 2/1 C+Ex	4	3.
NFPL135	Physics of Materials I	W 2/1 C+Ex	4	3.
NFPL137	Technology of Materials	S 2/0 Ex	3	3.
NFPL134	Thermodynamics of Materials ^{!!}	W/S 2/0 Ex	3	3.
NTMF061	Group Theory and its Applications in Physics	W 2/2 C+Ex	6	3.
NOOE139	Advanced optics	W 3/2 C+Ex	7	3.
NFPL150	Nanomaterials II	W/S 2/0 Ex	3	3.
MB100P01	Seeing is believing I - Everyday Microscopy for Biologists ^{ob rok}	S 2/1 C+Ex	4	3.
MB100P02	Seeing is believing II — Advanced Microscopy for Everyone ^{!! ob rok}	S 2/1 C+Ex	4	3.
MB100P03	Fluorescence-lifetime imaging microscopy (FLIM) not only for biologists — practical aspects with hands-on experience ^{ob rok}	W 0/3[D] C	2	3.
MB120C14	Experimental plant ecology	S 1/2 C+Ex	4	3.
MB120P113	Conservation Biology	S 3/0 Ex	4	3.
MB120P184	Botany of non-vascular plants ^N	S 3/0 Ex	4	3.
MB120C121	Botany of non-vascular plants — a practical course ^{KN}	S 0/2 C	2	3.

MB120P166	<i>Introduction to plant systematics, evolution and ecology</i>	W/S 2/0 Ex	3	3.
MB120T64	<i>Field course in botany</i>	S 0/1[T] C	3	3.
MB130P13E	<i>Plant Physiology^N</i>	W 2/3 C+Ex	5	3.
MB130P61E	<i>Plant anatomy^N</i>	W 2/2 C+Ex	5	3.
MB140C35	<i>Practical molecular biology</i>	S 0/1[T] C	3	3.
MB140C75E	<i>Fluorescence spectroscopy in biology</i>	W 0/1[T] MC	2	3.
MB140P16E	<i>Principles of Genetics</i>	W 2/2 C+Ex	5	3.
MB140P71E	<i>Essentials of Molecular Biology</i>	S 3/0 Ex	4	3.
MB140P81E	<i>Molecular Virology: Virus Replication Strategies</i>	W 3/0 Ex	4	3.
MB140P86	<i>Methods of functional genomics</i>	S 4/0[D] Ex	3	3.
MB140P88E	<i>General Microbiology</i>	S 2/0 Ex	3	3.
MB140P91	<i>Molecular and Immunologic Mechanism of Viral Pathogenesis</i>	W 2/0 Ex	3	3.
MB150C07E	<i>Developmental biology — a practical course^N</i>	S 0/3 C	2	3.
MB150C27E	<i>Histology — a Practical Course^N</i>	S 0/2[D] C	1	3.
MB150C31	<i>Practical course in animal and human physiology^N</i>	W/S 0/1[T] C	3	3.
MB150P14E	<i>Immunology^N</i>	W 2/0 Ex	3	3.
MB150P59	<i>Neurobiology^N</i>	W 2/0 Ex	3	3.
MB150P77E	<i>Histology^N</i>	S 3/0 Ex	4	3.
MB150P85	<i>Epigenetics</i>	W 2/0 Ex	3	3.
MB150P95	<i>Chronobiology^N</i>	S 2/0 Ex	3	3.
MB151C01E	<i>Single molecule microscopy and manipulation — practical course</i>	W 0/1[T] C	3	3.
MB151C15E	<i>Immunology — a Practical Course^{K N}</i>	W 0/1[T] C	3	3.
MB151P123E	<i>Cell Biology and Biochemistry</i>	W 3/0 Ex	4	3.
MB151P125	<i>Molecules of Life & Mutations</i>	S 2/3[D] Ex	3	3.
MB151P80E	<i>Cytometry^N</i>	S 2/1 C+Ex	4	3.
MB160C25E	<i>Introduction to Parasitology: a Practical Course</i>	W 0/2 C	2	3.
MB160C45E	<i>Microscopic Techniques</i>	W 0/20[H] C	2	3.
MB160C84E	<i>Laboratory Methods: a Practical Course</i>	S 0/3 C	3	3.
MB162P47	<i>General Ecology^N</i>	S 3/0 Ex	5	3.
MB160P66	<i>Parasitology</i>	W/S 2/0 Ex	3	3.
MB160P80E	<i>General Parasitology: from Viruses to Animals</i>	W 3/0 Ex	4	3.
MB170P106	<i>Ethology and sociobiology</i>	W 2/0 C+Ex [+1D]	5	3.
MB170P124	<i>Basics of Evolutionary Biology^N</i>	W 2/0 Ex	3	3.
MO550P105	<i>Population ecology and species protection</i>	S 2/0 Ex	4	3.

<i>MO550P95E</i>	<i>Introduction to Ecology^N</i>	<i>S 2/0 Ex</i>	<i>5</i>	<i>3.</i>
<i>NFPL010</i>	<i>Quantum Theory I^{1N}</i>	<i>W 4/2 C+Ex</i>	<i>9</i>	<i>3.</i>
<i>MC270C93</i>	<i>Practical Organic Chemistry^{PN}</i>	<i>W/S 0/2[T] C</i>	<i>4</i>	<i>3.</i>
<i>MC270P108A</i>	<i>Organic Chemistry I^N</i>	<i>W 3/2 C+Ex</i>	<i>5</i>	<i>3.</i>
<i>MC270P108B</i>	<i>Organic Chemistry II^N</i>	<i>S 3/2 C+Ex</i>	<i>5</i>	<i>3.</i>
Minimal credits: 18				

Recommended option courses

Code	Subject	Amount	Cr.	Adv. Year.
MS107034	Philosophy and Science	S 2/0 Ex	3	1+
MS730A	Physical Education I	W 0/2 C	1	1+
MS730A2	Physical Education II	W 0/2 C	1	2+
MS730B	Physical Education I	S 0/2 C	1	1+
MS730B2	Physical Education II	S 0/2 C	1	2+
MS730C	Physical Education — Optional ^O	W/S 0/1 C	1	1+
MS730LK	Summer Training Course I	S 0/1[T] C	1	1+
MS730LK2	Summer Training Course II	S 0/1[T] C	1	2+
MS730ZK	Winter Training Course	W 0/1[T] C	1	1+

8.7. Study program Geology

Guarantor of the study program: doc. RNDr. Petr Jeřábek, Ph.D.

Study specializations:

- Geodynamics

Recommended study plan

A. Parts of the state examination are listed for individual specializations

B. The total amount of credits for general obligatory courses: **55**

C. The minimum amount of credits for general elective courses: **0**

D. Conditions for students to be able to take the two parts of the state examination

SZ1: MDIPL003 (Diploma thesis)

- complete successfully all the obligatory courses
- obtain the minimum amount of credits in all the groups of elective courses
- obtain the minimum of 180 credits.

SZ2: codes and title are listed for individual specializations

- complete successfully all the obligatory courses with the exception of MG400DG4 (Diploma project IV)
- obtain the minimum amount of credits in all the groups of elective courses

General obligatory courses

Code	Subject	Amount	Cr.	Adv. Year.
MG400DG1	Diploma project I	W 0/1 C	10	1.
MG400DG2	Diploma project II	S 0/1 C	10	1.

MG400DG3	Diploma project III	W 0/5 C	10	2.
MG400DG4	Diploma project IV	S 0/20 C	25	2.
Obligatory courses			55	

8.7.1. Specialization Geodynamics

A. Parts of the state examination (topics are listed in SIS):

SZ1: MDIPL003 (Diploma thesis)

SZ2: MSZGN027 (Geology — Geodynamics)

B. The total amount of credits for specialized obligatory courses: **0**

C. The minimum amount of credits for specialized elective courses: **53**

Specialized elective courses

Code	Subject	Amount	Cr.	Adv. Year.
MG440P35	<i>Advanced Metamorphic Petrology</i>	W 2/1 Ex	4	1.
MG440P26	<i>Rheology and Deformation Microstructures</i>	W 2/1 C+Ex	4	1.
MG440P46	<i>Advanced Structural Geology</i>	W 2/1 Ex	4	1.
MG440P23	<i>Isotope Geochemistry — Geochronology</i>	W 2/1 C+Ex	5	1.
MG440P44	<i>Data analysis in R and Python</i>	W 1/2 Ex	4	1.
MG440C28A	<i>Advanced Reading Course</i>	W 0/2 C	2	1.
MG440S51A	<i>Seminar in Petrology and Structural Geology</i>	W 0/1 C	1	1.
MG440P24	<i>Igneous Processes</i>	S 2/1 C+Ex	4	1.
MG440P73	<i>Numerical Modelling of Heat Transfer in Geology</i>	S 1/2 C+Ex	4	1.
MG440P70	<i>Dynamics of Magma Chambers</i>	S 2/1 Ex	4	1.
MG440C79	<i>Microanalysis of Geomaterials</i>	S 1/2 C	3	1.
MG440C28B	<i>Advanced Reading Course</i>	S 0/2 C	2	1.
MG440C64	<i>Advanced Polarization Microscopy</i>	S 0/2 C	2	1.
MG440T30	<i>Field Course in Geodynamics^O</i>	S 5/0[D] C	2	1.
MG440S51B	<i>Seminar in Petrology and Structural Geology</i>	S 0/1 C	1	1.
MG440P37	<i>Geodynamics of Lithosphere</i>	W 2/1 C+Ex	4	2.
MG440P55	<i>Magnetic Anisotropy and Paleomagnetism</i>	W 1/0 Ex	2	2.
MG440P113	<i>Geophysical Imaging in Geodynamics</i>	W 1/1 Ex	3	2.
MG440S51C	<i>Seminar in Petrology and Structural Geology</i>	W 0/1 C	1	2.
MG440C111	<i>Advances in Petrology and Structural Geology^O</i>	W 0/1[T] C	1	2.
MG440P71	<i>Geological Thermodynamics^{!!}</i>	S 3/2 C+Ex	6	2.
MG440S51D	<i>Seminar in Petrology and Structural Geology</i>	S 0/1 C	1	2.

Minimal credits: 53

Credits for repeated completion of repeatable courses are not included in the sum of credits of elective courses.