

**University of Maribor**  
**Faculty of Natural Sciences and Mathematics**

**Information on the undergraduate programme**  
*Biology*

**A) General description**

## **QUALIFICATION AWARDED**

### **Undergraduate programme of university studies Biology**

Qualification awarded: University degree in Biology.

Duration of study: 3 years

## **ADMISSION REQUIREMENTS**

### **Undergraduate university programme:**

- a) a successfully completed Matura examination, or
- b) a successfully completed vocational leaving exam and exam from one of the subjects of the Matura examination; the selected subject can not be one of the subjects passed on the vocational leaving exam; or
- c) Successfully finished secondary school before June 1, 1995.

In case of enrolment limitations, applicants under a) are admitted according to their GPA on the Matura examination or final exam (60% of the points) and their overall GPA in the third and the fourth year of secondary school (40% of the points).

## **EDUCATIONAL AND PROFESSIONAL GOALS**

Primary goal of the first level study programme of Biology is to educate professional biologists that will be able to understand different segments of living nature on all levels (molecules – organelles – cells – tissues – organisms – community) and to be able to recognize its patterns and processes. Fast development of biology and its applications, e. g. biotechnology, gave an impulse (idea) and the need for a study programme that would integrate all natural sciences and mathematics with the intention of solving biological problems.

The crisis of biodiversity and the need for harmonic sustainable development are reviving chapters from »classical biology« reformed and modernized in a way for biology to give answers to future challenges, to science, technology, sustainable development or biodiversity conservation. These are the goals of the programme that is making room for biology in Slovenia.

The programme aims to educate a natural scientist with enough knowledge from natural sciences also other than biology, basic and new biological disciplines that on one hand direct biotechnological development and on the other hand create solutions for biodiversity and environmental crises.

The study is in one way designed to cover traditional or classical biological subjects such as botany, zoology, physiology, ecology that present the basis for solving biodiversity and environmental problems. And at the same time the programme includes also contemporary branches of biology and boundary disciplines between biology and physics, chemistry and mathematics.

### **The main general competences achieved by the graduates:**

- Graduates gain the ability to analyze, synthesize and forecast, offer solutions and understand the consequences of natural phenomena and processes on different levels.
- Graduates master research methods, procedures and processes in biology and are able to develop different self-critical judgements in this field. They gain knowledge of

constituents of the “classical biology” – especially biodiversity, molecular biology and physiologic and boundary disciplines as biophysics, biochemistry, biostatistics and nature conservation.

- Graduates are able to use knowledge from nature conservation topics, especially biology on different levels.
- Graduates are autonomous in professional work in the field of biology.
- Graduates master communication and other skills that enable them to integrate into team work in local as well as international business and scientific environment.
- Graduates are aware of restrictions set up by professional ethics in this field of nature conservation.
- Graduates develop positive relation towards nature and environment.
- Graduates have critical relation towards human interventions in nature.

#### **The main specific competences achieved by the graduates:**

- Graduates are familiar with all basic theoretical and applicative standpoints of biology as a scientific discipline.
- Graduates master individual levels of biology from molecules to ecosystems.
- Graduates are qualified for integrating knowledges of different natural sciences.
- Graduates are qualified for system thinking that enables them to integrate into interdisciplinary working groups coping with biological and related scientific, professional and practical problems.
- Ability to solve biological problems on the “macro-level”; from basic (research) to applicable (project work in administration and economy).
- Use and establishment of integrative information system in biology.

#### **ACCESS TO FURTHER STUDIES**

Graduates of the undergraduate university programme Biology can continue their studies at the second level leading to the second bologna degree. Graduates of the postgraduate level will be able to continue the studies at a higher level leading to the Doctor degree.

#### **COURSE STRUCTURE DIGRAM WITH CREDITS**

Complete curricula of the undergraduate university programme of the Biology are given in the following pages. All the courses (obligatory and elective) are given together with the semester of study, the amount and type of the contact hours and the assigned number of the ECTS credits. The abbreviations in the curriculum have the following meaning:

L – Lectures

EL – experimental lectures

S – Seminar

T – Tutorial

LW – lab work

FW – field work

## Undergraduate university programme Biology

### 1<sup>st</sup> year, 1<sup>st</sup> semester

| Course number | Course title        | L /EL | S | T  | LW  | FW | Total contact hours | Individual work | Total hours/ ECTS |
|---------------|---------------------|-------|---|----|-----|----|---------------------|-----------------|-------------------|
| 1             | Mathematics         | 30    |   | 30 |     | 30 | 60                  | 120             | 180/6             |
| 2             | Physics             | 30    |   |    | 30  |    | 60                  | 120             | 180/6             |
| 3             | Chemistry           | 45    |   |    | 30  |    | 75                  | 105             | 180/6             |
| 4             | Biology of the Cell | 45    |   |    | 45  |    | 90                  | 90              | 180/6             |
| 5             | General Botany      | 30    |   |    | 30  |    | 60                  | 120             | 180/6             |
|               | Cummulative         | 180   |   | 30 | 135 | 30 | 345                 | 555             | 900/30            |

### 1<sup>st</sup> year, 2<sup>nd</sup> semester

| Course number | Course title                               | L /EL | S | T | LW  | FW | Total contact hours | Individual work | Total hours/ ECTS |
|---------------|--------------------------------------------|-------|---|---|-----|----|---------------------|-----------------|-------------------|
| 6             | Fundamentals of Zoology                    | 45    |   |   | 45  |    | 90                  | 90              | 180/6             |
| 7             | Biochemistry                               | 45    |   |   | 30  |    | 75                  | 105             | 180/6             |
| 8             | Systematics and evolution of lower plants  | 30    |   |   | 30  |    | 60                  | 90              | 150/5             |
| 9             | Systematics and evolution of hygher plants | 45    |   |   | 30  | 30 | 105                 | 105             | 210//7            |
| 10            | Human Biology                              | 30    |   |   | 30  |    | 60                  | 120             | 180/6             |
|               | Cummulative                                | 195   |   |   | 165 | 30 | 390                 | 510             | 900/30            |

### 2<sup>nd</sup> year, 3<sup>rd</sup> semester

| Course number | Course title                               | L /EL | S | T | LW  | FW | Total contact hours | Individual work | Total hours/ ECTS |
|---------------|--------------------------------------------|-------|---|---|-----|----|---------------------|-----------------|-------------------|
| 11            | Systematycs and phylogeny of Invertebrates | 45    |   |   | 30  | 15 | 90                  | 120             | 210/7             |
| 12            | Systematycs and phylogeny of Vertebrates   | 30    |   |   | 30  |    | 60                  | 90              | 150/5             |
| 11            | Principal and Animal Ecology               | 60    |   |   | 15  | 15 | 90                  | 150             | 240/8             |
| 12            | Geology with Paleontology                  | 30    |   |   | 15  | 15 | 60                  | 60              | 120/4             |
| 13            | Elective Course*                           | 30    |   |   | 15  |    | 45                  | 135             | 180/6             |
|               | Cummulative                                | 195   |   |   | 105 | 30 | 330                 | 570             | 900/30            |

\*See the Table of Elective Courses

### 2<sup>nd</sup> year, 4<sup>th</sup> semester

| Course number | Course title             | L /EL | S | T  | LW | FW  | Total contact hours | Individual work | Total hours/ ECTS |
|---------------|--------------------------|-------|---|----|----|-----|---------------------|-----------------|-------------------|
| 14            | Plant Ecology            | 45    |   |    | 15 | 15  | 75                  | 105             | 180/6             |
| 15            | Principles of Statistics | 30    |   | 15 |    |     | 45                  | 105             | 150/5             |
| 16            | Biogeography             | 30    |   |    |    | 30  | 60                  | 90              | 150/5             |
| 17            | Biology Field Course     |       |   | 15 |    | 90  | 105                 | 135             | 240/8             |
| 18            | Elective Course*         | 30    |   |    | 15 |     | 45                  | 135             | 180/6             |
|               | Cummulative              | 135   |   | 30 | 30 | 135 | 330                 | 570             | 900/30            |

\*See the Table of Elective Courses

### 3<sup>rd</sup> year, 5<sup>th</sup> semester

| Course number | Course title                         | L /EL | S | T | LW  | FW | Total contact hours | Individual work | Total hours/ ECTS |
|---------------|--------------------------------------|-------|---|---|-----|----|---------------------|-----------------|-------------------|
| 19            | Introduction to Biotechnology        | 30    |   |   | 30  | 15 | 75                  | 105             | 180/6             |
| 20            | Genetics of Eukaryotes               | 30    |   |   | 30  |    | 60                  | 120             | 180/6             |
| 21            | Microbiology and Procaryote Genetics | 45    |   |   | 30  |    | 75                  | 105             | 180/6             |
| 22            | Biodiversity                         | 45    |   |   | 15  | 15 | 75                  | 105             | 180/6             |
| 23            | Elective Course*                     | 30    |   |   | 15  |    | 45                  | 135             | 180/6             |
|               | Cummulative                          | 180   |   |   | 120 | 30 | 330                 | 570             | 900/30            |

\*See the Table of Elective Courses

### 3<sup>rd</sup> year, 6<sup>th</sup> semester

| Course number | Course title                                             | L /EL | S  | T  | LW  | FW  | Total contact hours | Individual work | Total hours/ ECTS |
|---------------|----------------------------------------------------------|-------|----|----|-----|-----|---------------------|-----------------|-------------------|
| 24            | Animal Physiology                                        | 45    |    |    | 30  |     | 75                  | 105             | 180/6             |
| 25            | Plant Physiology                                         | 45    |    |    | 30  |     | 75                  | 105             | 180/6             |
| 26            | Project management                                       | 15    |    |    | 30  |     | 45                  | 75              | 120/4             |
| 27            | Elective Course*                                         | 30    |    |    | 15  |     | 45                  | 135             | 180/6             |
| 28            | Scientific methods in biology and ecology of plants      |       | 30 | 15 |     |     | 45                  | 75              | 120/4             |
|               | Scientific methodology in biology and ecology of animals | 15    | 30 |    |     |     | 45                  | 75              | 120/4             |
|               | Cummulative                                              | 150   | 60 | 15 | 105 | 150 | 330                 | 570             | 900/30            |

\*See the Table of Elective Courses

## Elective Courses

### Elective Courses of the 2<sup>nd</sup> year

| Course number | Course title                          | L /EL | S | T | LW | FW | Total contact hours | Individual work | Total hours/ ECTS |
|---------------|---------------------------------------|-------|---|---|----|----|---------------------|-----------------|-------------------|
| 1             | Systems biology                       | 30    |   |   | 15 |    | 45                  | 135             | 180/6             |
| 2             | Principles of Environmental Chemistry | 30    |   |   | 15 |    | 45                  | 135             | 180/6             |
| 3             | Entomology                            | 30    |   |   | 15 |    | 45                  | 135             | 180/6             |
| 4             | Etology                               | 30    |   |   | 15 |    | 45                  | 135             | 180/6             |
| 5             | Microbial Ecology                     | 30    |   |   | 15 |    | 45                  | 135             | 180/6             |

### Elective Courses of the 3<sup>rd</sup> year

| Course number | Course title                                  | L /EL | S  | T | LW | FW | Total contact hours | Individual work | Total hours/ ECTS |
|---------------|-----------------------------------------------|-------|----|---|----|----|---------------------|-----------------|-------------------|
| 1             | Plant Tissue Cultures                         | 15    | 15 |   | 15 |    | 45                  | 135             | 180/6             |
| 2             | Conservation Biology of Mammals and Birds     | 15    | 15 |   |    | 15 | 45                  | 135             | 180/6             |
| 3             | Plant Cell Responses to Environmental Impacts | 30    |    |   | 15 |    | 45                  | 135             | 180/6             |
| 4             | Phytocoenology                                | 15    |    |   | 15 | 15 | 45                  | 135             | 180/6             |
| 5             | Speleobiology                                 | 15    |    |   | 15 | 15 | 45                  | 135             | 180/6             |

## **FINAL EXAMINATION**

There is no final examination other than the defence of the bachelor thesis.

## **EXAMINATION AND ASSESMENT REGULATIONS**

The examinations are usually written and oral. Some of the courses involve the preparation of a seminar work which is usually defended by an oral presentation. The oral examination is usually preconditioned by laboratory attendance, the successful completion of the written exam and the seminar work where required.

Timetables of examinations are issued yearly by the Faculty senate at the beginning of the academic year and are published on the faculty web page and on the notice boards. There are at least 6 examinations for each course per academic year and students are free to choose the date of examination. The students need to register for examination 7 days before the examination date. The examination can be cancelled no later than 3 days before the examination date. The use of calculators, literature and other items during the examination is determined by the lecturer and may vary from course to course.

The diploma work is presented publicly before an examination board composed of the Head of the Chair, the diploma work mentor and co-mentor.

## **ECTS DEPARTMENTAL CO-ORDINATOR**

ECTS departmental co-ordinator is the actual head of the department.

**Information on the degree programme**  
***Biology***

**B) List of Subjects**

## Undergraduate university programme Biology

| Code | Course title                                             | Type | ECTS |
|------|----------------------------------------------------------|------|------|
|      | Animal Physiology                                        | O    | 6    |
|      | Biogeography                                             | O    | 5    |
|      | Biochemistry                                             | O    | 6    |
|      | Biology Field Course                                     | O    | 8    |
|      | Biology of the Cell                                      | O    | 6    |
|      | Human Biology                                            | O    | 6    |
|      | Chemistry                                                | O    | 8    |
|      | Conservation Biology of Mammals and Birds                | E    | 6    |
|      | Entomology                                               | E    | 6    |
|      | Ethology                                                 | E    | 6    |
|      | Fundamentals of Zoology                                  | O    | 6    |
|      | General Botany                                           | O    | 6    |
|      | Genetics of Eukaryotes                                   | O    | 6    |
|      | Geology with Paleontology                                | O    | 4    |
|      | Introduction to Biotechnology                            | O    | 6    |
|      | Mathematics                                              | O    | 5    |
|      | Microbial Ecology                                        | E    | 6    |
|      | Microbiology and Prokaryote Genetics                     | O    | 6    |
|      | Systems biology                                          | E    | 6    |
|      | Physics                                                  | O    | 5    |
|      | Plant Cell Responses to Environmental Impacts            | E    | 6    |
|      | Plant Ecology                                            | O    | 6    |
|      | Plant Tissue Cultures                                    | E    | 6    |
|      | Plant Physiology                                         | O    | 6    |
|      | Principal and Animal Ecology                             | O    | 8    |
|      | Principles of Environmental Chemistry                    | E    | 6    |
|      | Principles of Statistics                                 | O    | 5    |
|      | Project Management                                       | O    | 4    |
|      | Speleobiology                                            | E    | 6    |
|      | Systematics and evolution of lower plants                | O    | 7    |
|      | Systematics and evolution of higher plants               | O    | 5    |
|      | Systematics and phylogeny of Invertebrates               | O    | 7    |
|      | Systematics and phylogeny of Vertebrates                 | O    | 5    |
|      | Scientific methods in biology and ecology of plants      | O    | 4    |
|      | Scientific methodology in biology and ecology of animals | O    | 4    |

O ... obligatory course    E ... elective course