

Doctoral school, UKIM
Study program in BIOLOGY, Institute of biology,
Faculty of Natural Sciences
Accreditation, 2017

Years and semesters of the duration of the study program

The studies last for three years, i.e. 6 (six) semesters.

ECTS credits that the student acquires

The studies allow the acquisition of a minimum of 180 ECTS credits.

Method of financing and proof of quality financial guarantee for the study program (for private higher education and scientific institutions)

Candidates are enrolled as full-time students with self-financing studies at the Institute of Biology. The tuition fee is 5000 € (in MKD counter value according to the average exchange rate of the NBRM). The total amount includes the defense of the doctoral dissertation.

Enrollment conditions

The study program of the third cycle doctoral studies have the right to enroll persons who meet the requirements quoted in Articles 13, 14 and 15 of the University Newsletter (year XIII, no.245, 2 May 2013). The conditions and criteria for enrollment of students of studies at the University "St. Cyril and Methodius" shall be prescribed by the University Rectorate in accordance with the legal regulations and recommendations of the Ministry of Education and Science.

STRUCTURE OF THE STUDY PROGRAM in accordance with the rulebook for organizing doctoral studies of the unit, number of envisaged courses and acquired credits, as well as number of credits acquired with the preparation of the doctoral thesis

In the structural organization of this study program certain criteria must be met:

- During the studies, the student should collect 180 ECTS credits;
- The number of credits is 30 ECTS per semester or 60 during one year;
- One loan involves 30 hours of work. Exercising 60 credits means 1800 hours of load;
- Teaching is performed in 15 weeks in one semester or thirty weeks in one school year.

The study program of doctoral studies is built up of several components that have a logical sequence. Namely, it consists of:

1. Three courses for acquiring generic knowledge and research skills, which is 12 credits (each subject from this group is valued at 4 credits). Here are one subject from the group of subjects "Research and ethics with application and examples in the area", one subject from the group of courses "Methodology of the scientific research with application and examples in the area" and another subject from the offered list of other subjects from the research training, which, on the proposal of the unit responsible for the study programs, is confirmed by the University Expert Council for Doctoral Studies.
2. Doctoral seminars, conferences and workshops from research practice are 18 credits. The seminar and the annual conference are organized for each academic year and are realized with a public presentation. Each public presentation of the seminar and annual conference is valued at 2 credits (2 + 2 + 2 - public presentation, 2 + 2 + 2 - annual conference). Workshops on research practice are organized within the study program. Each workshop is valued at 3 credits (3 + 3).
3. Education training covers four courses in the field, area and narrow area of the research, which is 30 credits (7,5 ECTS for each subject). In this group of subjects belong electives.

The activities related to the preparation and application of the doctoral dissertation include:

- Research based on the preparation of a doctoral dissertation theme (in II semester) is evaluated with 14 credits;
- Research, preparation and submission of the application on the topic of doctoral dissertation (in III semester) are valued at 28 credits;
- Research and publication results (in the IV semester) are valued at 25 credits; Research and publication results (in V semester) are valued at 28 credits; Research and writing the thesis (in VI semester) are valued at 25 credits.

The teaching program is conducted in Macedonian language. According to the needs and affinity of the candidates, certain parts can be organized and conducted in English as well. The teaching literature may also be in one of the world languages.

The teaching of doctoral studies is organized in two forms:

- Group teaching, which is the basic form of doctoral studies and can be organized in all subjects. The smallest number of students for which group classes should be organized is 5 candidates.
- Individual instruction (mentoring) held in the form of consultations. The smallest number of students for which an individual instruction should be organized is 1 candidate.

Professors from other schools for doctoral studies, faculties, institutions and other Universities of the country and abroad can participate in the realization of the doctoral studies, under conditions determined by the Law, Statute and the Rulebook of the University "St. Cyril and Methodius".

Distribution of the subjects and credits by years:

The teaching of the third cycle is organized in a three-year curriculum that takes place over six semesters.

I year: basic (generic) subjects (12 credits), seminars (4 credits), doctoral thesis (14 credits), subjects from the field, subjects in the field of research, specific subjects from the narrow area of the research (30 credits);

II year: research work preparation of the doctoral dissertation preparation of the topic, submission of a report on the topic of doctoral dissertation, research and publication results (53 credits), participation in publications of scientific paper, doctoral seminar with presentation of report, annual conference (4 credits) and workshop on research practice (3 credits);

III year: research work (research and publication of results, writing the thesis (53 credits), scientific activity (doctoral seminar with presentation of report, annual conference (4 credits) and workshop for research practice (3 credits). The studies are adapted according to the European Credit Transfer System for equivalence of exams and credits, which creates conditions for mobility of students enrolled in the third cycle of studies.

Structure of the study program (valid for all modules)

Subject	E	T	L	Credits
1. semester				
1. Scientific research ethics with application and examples in the area (subject for generating generic knowledge from the list of mandatory subjects for acquiring generic knowledge)	60	30	30	4
2. Methodology of research work with application and application in the area (subject for acquiring generic knowledge from the list of elective subjects for acquiring generic knowledge)	60	30	30	4
3. Compulsory subject from the field and field of research	90	45	45	7.5
4. Optional subject from the field and field of research	60	30	30	7.5
5. Optional subject from the field and field of research	60	30	30	7.5
Total				30.5

2. semester				
6. Optional subject from the University list of subjects for acquiring generic knowledge	30	30	0	4
7. Compulsory subject from the field and field of research	90	45	45	7.5
Research for preparation of a doctoral thesis	60	30	30	14
Scientific seminar with presentation	/	/	/	2
Annual conference with presentation of the report	/	/	/	2
Total				29.5
3. semestár				
Preparation and reporting on the topic of doctoral dissertation and research	/	/	/	28
Scientific seminar with presentation	/	/	/	2
Total				30
4.semestár				
Research and publication of results	/	/	/	25
Workshop for research practice	/	/	/	3
Annual conference with presentation of the report	/	/	/	2
Total				30
5.semester				
Research and publication of results	/	/	/	28
Scientific seminar with presentation	/	/	/	2
Total				30
6.semester				
Research and writing the thesis	/	/	/	25
Workshop for research practice	/	/	/	3
Annual conference with presentation of the report	/	/	/	2
Total				30

Organization of the teaching of the third cycle

- basic (generic) subjects (12 ECTS);
- specific subjects from the narrow field of research (30 ECTS);
- scientific and research activity (120 ECTS);
- participation in seminars, workshops, congresses, writing reports over three years (18 ECTS).

BASIC GENERAL COURSES

(for acquiring general generic knowledge)

1. List of compulsory subjects from the group of subjects for acquiring generic knowledge and skills for research - (valid for all modules):

Code	Subject	Teacher	ECTS
BB111234500	Scientific research ethics with application and examples in the field of biological sciences	30% general part teacher from University list, 70% special part a group of teachers from Institute of Biology	4

2. List of elective courses from the Institute of Biology for the acquisition of generic knowledge and skills for research - (valid for all modules):

Code	Subject	Teacher	ECTS
BB211234501	Methodology of scientific and research work with application and examples in the field of cytology and histology	30% general part teacher from University list, 70% special part a group of teachers from Institute of Biology	4
BB211234502	Methodology of scientific and research work with application and examples in the field of molecular biology and genetics	30% general part teacher from University list, 70% special part a group of teachers from Institute of Biology	4
BB211234503	Methodology of scientific and research work with application and examples in the field of physiology and biochemistry	30% general part teacher from University list, 70% special part a group of teachers from Institute of Biology	4
BB211234504	Methodology of scientific and research work with application and examples in the field of ecology	30% general part teacher from University list, 70% special part a group of teachers from Institute of Biology	4
BB211234505	Methodology of scientific and research work with application and examples in the field of biosystematics and taxonomy	30% general part teacher from University list, 70% special part a group of teachers from Institute of Biology	4
BB211234506	Methodology of scientific and research work with application and examples in the field of microbiology and microbial biotechnology	30% general part teacher from University list, 70% special part a group of teachers from Institute of Biology	4

3. A list of electives from the University list of subjects for acquiring generic knowledge, applies to all modules (one subject is selected):

A list of electives from the University list of subjects			
Код	Предмет	Предавач	ЕКТС
ББ1101	BASICS OF TASCONOMY OF VASCULAR PLANTS	Акад. д-р Владо Матевски, проф. д-р. Митко Костадиновски, доц. д-р Рената Куштеревска	4
ББ1102	PALEOLIMNOLOGY	Проф. д-р Светислав Крстиќ	4
ББ1103	ECOLOGY OF FOREST ECOSYSTEMS	Проф. д-р Љупчо Меловски	4
ББ1104	ECOLOGY OF GRASSLAND ECOSYSTEMS	Проф. д-р. Славчо Христовски	4
ББ1105	IN VITRO МОДЕЛИ НА РАСТИТЕЛНИ КЛЕТКИ И ТКИБА	Проф. д-р Соња Гацовска Симиќ, Проф. д-р Ленка Цветановска Доц. д-р Оливер Тушевски	4
ББ1106	METABOLIC PLANT ENGINEERING	Проф. д-р Соња Гацовска Симиќ, Проф. д-р Ленка Цветановска Доц. д-р Оливер Тушевски	4

ББ1107	FUNGI IN MACEDONIA	Проф. д-р Митко Караделев Доц. д-р Катерина Русевска	4
ББ1108	FORENSIC PHYSIOLOGY - CHEMATOLOGY	Проф. д-р Ицко К. Ѓоргоски Проф. д-р. Митко Младенов Доц. д-р Никола Хаџи-Петрушев	4
ББ1109	PHYSIOLOGY AND BIOPHYSICS OF ION CHANNELS	Проф. д-р Ицко К. Ѓоргоски Проф. д-р. Митко Младенов Доц. д-р Никола Хаџи-Петрушев	4
ББ1110	ECOTOXICOLOGY	Проф. д-р. Сузана Диневска – Ќовкаровска Проф д-р Биљана Миова	4
ББ1111	MOLECULAR AND INTEGRATIVE PHYSIOLOGY	Проф. д-р. Сузана Диневска – Ќовкаровска Доц д-р Биљана Миова	4
ББ1112	EXPERIMENTAL PROTOCOL: WORK WITH ANIMAL MODEL BIOMEDICIAN RESEARCH	Проф. Д-р Јасмина Димитрова - Шумковска	4
ББ1113	PHYSIOLOGY OF INFLAMATION PROCESSES	Проф. д-р Ицко К. Ѓоргоски Проф. д-р. Митко Младенов Доц. д-р Никола Хаџи-Петрушев	4
ББ1114	SELECTED TOPICS OF MICROANATOMY	Проф. д-р. Милица Ристовска, доц. д-р.Катерина Ребок	4
ББ1115	PARASITOLOGY	Проф. д-р Стое Смиљков	4
ББ1116	FORENSIC ENTOMOLOGY	Доц. д-р Валентина Славевска Стаменковиќ	4
ББ1117	DATA ANALYSIS IN ECOLOGY	Доц. д-р Александра Цветковска- Ѓорѓиевска	4
ББ1118	URBAN ECOSYSTEMS	Проф. д-р Дана Прелиќ	4
ББ1119	MICROORGANISMS IN WASTE WATER TREATMENT	Проф. д-р.Проф. Д-р Џоко Кунгуловски	4
ББ1120	MICROBIAL PHYSOLOGY	Проф. д-р. Наталија Атанасова- Панчевска	4
ББ1121	SELECTED CHARPTERS OF CYTOGENETICS	Проф. д-р Гордана Димеска	4
ББ1122	MOLECULAR GENETICS AND GENOMICS	Проф. д-р Сашо Панов	4
ББ1123	GENETIC MUTATIONS IN INBORN AND INHERITED DISSORDERS	Проф. д-р Мирјана Кочова, Доц. д-р Елена Шукарова	4
ББ1124	MOLECULAR DIAGNOSIS WITH NEW SEQENTIONAL TECHNOLOGIES	Проф. Дијана Плашевска	4

SUBJECTS FROM THE AREA and FIELD OF RESEARCH

4. A list of compulsory professional courses in the field of research, applies to all modules (two courses are selected):

A list of compulsory professional courses in the field of research			
Код	Предмет	Предавач	ЕКТС
ББ2101	DIVERSITY, VALORIZATION AND PROTECTION OF VEGETATION OF MACEDONIA	Акад. д-р Владо Матевски, проф. д-р. Митко Костадиновски, доц. д-р Рената Ќуштеревска	7,5

ББ2102	FLORA OF THE REPUBLIC OF MACEDONIA (DIVERSITY, RECLISTS, ENDEMISM, VALORIZATION, PROTECTION)	Проф. д-р. Владо Матовски	7,5
ББ2103	SYSTEMATICS OF SELECETED GROUP OF ORGANISMS – DIATOMEAS	Проф. д-р Светислав Крстиќ	7,5
ББ2104	ECOLOGICAL WATER MONITORING	Проф. д-р. Златко Левков	7,5
ББ2105	EVALUATION OF ECOSYSTEM SERVICES	Проф. д-р Љупчо Меловски	7,5
ББ2106	ECOLOGY OF EXTREME HABITATS	Проф. д-р. Славчо Христовски	7,5
ББ2107	PLANT BIOCHEMISTRY	Проф. д-р Соња Гаџовска Симиќ, Проф. д-р Ленка Цветановска Доц. д-р Оливер Тушевски	7,5
ББ2108	PLANT PHYSIOLOGY	Проф. д-р Соња Гаџовска Симиќ, Проф. д-р Ленка Цветановска Доц. д-р Оливер Тушевски	7,5
ББ2109	SELECTED TOPISC OF MICOLOGY	Проф. д-р Митко Караделев Доц. д-р Катерина Русевска	7,5
ББ2110	SELECETED TOPICS OF PHYSIOLOGY	Проф. д-р Ицко К. Ѓоргоски Проф. д-р. Митко Младенов Доц. д-р Никола Хаџи-Петрушев	7,5
ББ2111	ENDOCRINE REGULATION	Проф. д-р. Сузана Диневска – Ќовкаровска Проф д-р Биљана Миова	7,5
ББ2112	ENZIMOLOGY	Проф. д-р. Сузана Диневска – Ќовкаровска Доц д-р Биљана Миова	7,5
ББ2113	METABOLIC INTEGRATION	Проф. Д-р Јасмина Димитрова - Шумковска	7,5
ББ2114	REDOX SIGNALIZATION AND ANTIOXIDANTS	Проф. д-р Ицко К. Ѓоргоски Проф. д-р. Митко Младенов Доц. д-р Никола Хаџи-Петрушев	7,5
ББ2115	HISTOPATOLOGICAL BIOMARKERS	Проф. д-р Маја Јорданова	7,5
ББ2116	SELECETED TOPICS OF FUCTIONAL HYSTOLOGY	Доц. д-р Катерина Ребок	7,5
ББ2117	PRINCIPLES AND METHODS FOR THE PREPARATIN OF PLANS FOR MANAGEMENT OF PROTECTED AREAS	Проф. д-р Бранко Мицевски	7,5
ББ2118	BIOLOGY OF WATER INEVERTEVRATES	Проф. д-р Стое Смиљков	7,5
ББ2119	ANALYSIS AND VALORIZATION OF THE INVERTEBRATE FAUNA OF THE REPUBLIC OF MACEDONIA	Доц. д-р Валентина Славевска Стаменковиќ, доц. д-р Александра Цветковска-Ѓорѓиевска, проф. д-р Стое Смиљков, проф. д-р Дана Прелиќ	7,5
ББ2120	ICHTIOLOGY	Вон. проф. д-р Милица Ристовска	7,5
ББ2121	ECOLOGY OF SOIL FAUNA	Проф. д-р Дана Прелиќ Доц. д-р Александра Цветковска-Ѓорѓиевска	7,5
ББ2122	INDUSTRIAL MICROBIOLOGY	Проф. д-р.Проф. Д-р Џоко Кунгуловски	7,5
ББ2123	MICROBIAL BIOLOGY	Проф. д-р. Наталија Атанасова-Панчевска	7,5

ББ2124	PLANT GENOMS- ORGANIZATION, FUNCTION AND MECHANISMS OF EVOLUTION	Проф. д-р Гордана Димеска	7,5
ББ2125	METHODS IN MOLECULAR BIOLOGY	Проф. д-р Сашо Панов	7,5

5. A list of elective professional courses in the field of research, applies to all modules (two courses are selected):

A list of elective professional courses in the field of research			
Код	Предмет	Предавач	ЕКТС
ББ3101	APPLICATION OF SOFTWARE PACKAGES IN PHOTOCENOLOGY	Акад. д-р Владо Матевски, проф. д-р. Митко Костадиновски, доц. д-р Рената Ќуштеревска	7,5
ББ3102	SYSTEMATICS OF A SELECTED GROUP ORGANISMS - CYANO- BACTERIA	Проф. д-р Светислав Крстиќ	7,5
ББ3103	CLIMATE CHANGE IN THE QUARTERLY PERIOD	Проф. д-р. Златко Левков	7,5
ББ3104	MOLECULAR BIOLOGY OF PLANTS	Проф. д-р Соња Гаџовска Симиќ, Проф. д-р Ленка Цветановска Доц. д-р Оливер Тушевски	7,5
ББ3105	ECOLOGY OF FUNGI	Проф. д-р Митко Караделев Доц. д-р Катерина Русевска	7,5
ББ3106	SELECTED TOPICS OF IMMUNOLOGY	Проф. д-р Ицко К. Ѓоргоски Проф. д-р. Митко Младенов Доц. д-р Никола Хаџи- Петрушев	7,5
ББ3107	PHYSIOLOGY OF SIGNAL MOLECULES	Проф. д-р Ицко К. Ѓоргоски Проф. д-р. Митко Младенов Доц. д-р Никола Хаџи- Петрушев	7,5
ББ3108	PHYSIOLOGICAL MECHANISMS OF STRESS AND ADAPTATION	Проф. д-р Биљана Миова Проф. д-р. Сузана Диневска – Ќовкарска	7,5
ББ3109	METABOLIC REGULATION	Проф. д-р. Сузана Диневска – Ќовкарска Проф. д-р Биљана Миова	7,5
ББ3110	BIOCHEMICAL PATHOLOGICAL ASPECTS OF ORGANIC SYSTEMS	Проф. Д-р Јасмина Димитрова - Шумковска	7,5
ББ3111	PHYSIOLOGY OF FISH	Проф. д-р Маја Јорданова	7,5
ББ3112	SELECTED TOPICS OF ANIMAL HISTOPATOLOGY	Доц. д-р Катерина Ребок	7,5
ББ3113	PRINCIPLES AND METHODS FOR THE DEVELOPMENT OF ENVIRONMENTAL IMPACT ASSESSMENT STUDIES	Проф. д-р Бранко Мицевски	7,5

ББ3114	MACRO INVERTEBRATES AND THEIR APPLICATION IN MONITORING STUDIES	Проф. д-р Стое Смиљков	7,5
ББ3115	FRESH WATER ECOLOGY	Доц. д-р Валентина Славевска Стаменковиќ Вон. проф. д-р Милица Ристовска	7,5
ББ3116	DEVELOPMENTAL BIOLOGY	Проф. д-р.Милица Ристовска, доц. д-р Валентина Славевска- Стаменковиќ, доц. д-р Катерина Ребок, доц. д-р Александра Цветковска- Ѓеоргиевска	7,5
ББ3117	MICROBIC BIOTECHNOLOGY	Проф. д-р.Проф. Д-р Џоко Кунгуловски	7,5
ББ3118	MICROBIC ECOLOGY	Проф. д-р. Наталија Атанасова- Панчевска	7,5
ББ3119	EFFECTS OF GENOTHOSIC AGENTS	Проф. д-р Гордана Димеска	7,5
ББ3120	MOLECULAR GENETICS OF NEOPLASMS	Проф. д-р Сашо Панов	7,5
ББ3121	<i>IN VITRO</i> MODELS OF PLANT CELLS AND TISSUES	Проф. д-р Соња Гаџовска Симиќ, Проф. д-р Ленка Цветановска Доц. д-р Оливер Тушевски	7,5

Responsible for the Doctoral studies of the Institute of Biology in the period 2015-2019

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