# COURSES IN FOREIGN LANGUAGES for ERASMUS INCOMING STUDENTS

## 2022/2023

**Faculty of Biology**

**Faculty coordinator: Assoc. Prof. Dr. Trayana Nedeva, nedeva@biofac.uni-sofia.bg**

**Programme:** B.Sc. in Biology BLB010116

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
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| | | | | | | Lectures | Seminars | Practical work | | |
| BL E044 | Basic Entomology | English | BS | Summer | 3 | 30 | | 15 | Assoc. Prof. Albena Gjonova, PhD | gjonova@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course provides a general introduction to insect biology and systematics. The topics covered include insect structure, development, life histories and classification. The practical classes give students knowledge of the morphology, anatomy, immature stages and major orders of insects. The students become familiar with basic external and internal structures and their functions, different types of insect development and basic insect ecology. They learn how to prepare insect collection and distinguish the orders of insects and some common species. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |

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| BL C093 | Systematics of algae and fungi | English | BS | Winter | 6 | 45 | | 45 | Prof. Maya P. Stoyneva, PhD, DrSc, | mstoyneva @uni-sofia.bg |

**Short description of the course (in the language of instruction):** This **compulsory course** is oriented towards students in Biology and Ecology (regular education). It provides data on the structure, reproduction, distribution and classification of algae and fungi (incl. lichenized fungi) as significant components of ecosystems and their position in the systems of organisms. The course is of theoretical-applied character and provides basic knowledge on the cytology, morphology, physiological, biochemical and genetic peculiarities, reproduction and life cycles, bases of ecology and distribution, evolution and phylogeny of the main taxonomic groups of algae and fungi and their role in Nature.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL F045 | Lichenology | English | BS | Winter | 2 | 30 | 15 | | Prof. Maya P. Stoyneva, PhD, DrSc | mstoyneva@ uni-sofia.bg |

**Short description of the course (in the language of instruction):** This is a **facultative course for students** in regular education. It is with a theoretical-applied character. It shows the peculiar position of lichens in the organism world, the partner relations in this complex organism and possibilities for biosynthesis of lichen organisms. Data on the main anatomical and morphological organization of the lichen thalli, on the main types of reproduction and distribution, lichen classification and evolution are provided. When discussing the ecology and geographic distribution, their role as components of the ecosystem biodiversity is taken into account. Special attention is paid to the practical application of lichens, especially for bioindication, biomonitoring and lichenometry and to their use in perfumery and pharmaceutic industry. The main methods used in lichen taxonomy and in ecological-lichenological investigations, are explained.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| BL E186 | Mycology | English | BS | Summer | 3 | 30 | | 15 | Assoc. Prof. Blagoy Uzunov, PhD | buzunov@uni-sofia.bg |

**Short description of the course (in the language of instruction):** This is a **elective course for students** in regular education. The students will learn the most important representatives of the wild-growing fungi in Bulgaria, their edible, poisonous and threatened species and with measures for conservation of fungal resources.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E064 | Medicinal algae and fungi | English | BS | Summer | 3 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc | mstoyneva@uni-sofia.bg |

**Short description of the course (in the language of instruction):** This is a **elective course for students** in regular education. It provides knowledge on the main types of algal products and biologically-active compounds produced by cyanoprokaryotes and other eukaryotic algae, as well as on fungal toxins and secondary lichen metabolites. Additionally, data on the application of algae, fungi and lichens in both traditional and modern medicine and pharmacy and related with them food, cosmetic and perfumery industry are provided, together with the main possibilities and trends in the cultivation of the most important algae and fungi.

**Requirements for enrollment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E397 | Aquaculture | English | BS | Winter | 3 | 30 | | 15 | Assoc. Prof. Dr. Eliza Uzunova | euzunova@uni-sofia.bg |

**Short description of the course (in the language of instruction):** The course introduces the basic concepts and principles underlying the processes of cultivation of marine and freshwater organisms. It tracks the historical development of aquaculture - from its origins in ancient China to the present day. Students are acquainted with up-to-date statistics on world trends in aquaculture development, focusing on the main species in this sector - salmonid and cyprinid fishes. The course gives also a brief overview of the main groups of organisms that are cultivated in aquatic ecosystems - fish, algae, mollusks and crustaceans. The potential impacts of aquaculture on the environment are addressed in the light of global warming and water scarcity. Students will have the opportunity to be acquainted with the work in a re-circulating aquaculture system (RAS) and small pond farm as well.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C257 | Fundamentals of biodiversity – part Microbial biodiversity | English | BS | Winter | 5 | 30 | 15 | | Lectures: Assoc. Prof. Yovana Todorova, PhD | yovanatodorova@biofac.uni-sofia.bg |

**Short description of the course (done in the language of instruction):** The main objective of the course is to introduce the key issues of structural and metabolic biodiversity of microorganisms with emphasis of relationships of biodiversity with opportunities for assessment, rehabilitation, bioremediation and conservation of natural resources and processes.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E326 | Water treatment bio-control and management | English | BS | Summer | 3 | 30 | | 15 | *Lectures*: Prof. Yana Topalova, PhD, DSc | ytopalova@uni-sofia.bg |

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| | | | | | | | | | *Practical work:* Assist. Prof. Mihaela Belouhova PhD<br><br>Assist. Prof. Ivaylo Yotinov PhD | |

**Short description of the course (done in the language of instruction):** The course is aimed to introduce the basic biological, microbiological, hydrochemical methods and approaches for control and management of water treatment processes and technologies, natural water resources, self-purification processes. The specific target of course is verification and introduction of CCP (Critical Control Point) approach for water management and water treatment processes using biological indication.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E387 | Biological oceanography | English | BA/BS | Winter | 3 | 30 | | 15 | Assist. Prof. Desislava Rozdina, PhD | rozdina@uni-sofia.bg; |

**Short description of the course (in the language of instruction):** The students are introduced to the basics of the biological oceanography and to the general information about the World Ocean. The physical and chemical characteristics of the saltwater basins are considered as a basis for bio-productivity and zonation of the ongoing biological processes. The major marine communities and their interaction with the abiotic and biotic factors are considered in the context of the anthropogenic influence and the global climate changes. It is justified the need of sustainable utilization of the live marine resources (mainly fish) in the different regions of the World Ocean. Special attention is paid to the identical problems of the Black Sea ecosystem.

After completion of the course, the students will have knowledge about the status of the World Ocean and the anthropogenic influence (fishery, agriculture and forestry, energy, transport, industry) on its biological resources. Students will become familiar with methods for marine ecosystems research and for the management of biological resources under various anthropogenic pressures.

**Requirements for enrollment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C205 | Microbiology and virology | English | BS | Winter | 5 | 30 | | 30 | Assoc. Prof. Dr. Michail Iliev | miliev1@biofac.uni-sofia.bg |
| | | | | Summer | 5 | 20<br><br>10 | | 20<br><br>10 | Assoc. Prof. Dr. Ventzislava Petrova<br><br>Prof. Dr. Stoyan Shishkov | vpetrova@biofac.uni-sofia.bg<br><br>sshishkov@biofac.uni-sofia.bg |

**Short description of the course (done in the language of instruction):** The course aims to provide basic knowledge about prokaryotic microorganisms: structure and chemical composition of the cell; characteristics of energy and constructive metabolisms, genetic information transfer mechanisms, microbial systematics. Students are acquainted with the various prokaryotic forms. The main features of Archaea are also discussed. The distribution of microorganisms in the environment and their role in biogeochemical transformations in nature is presented. The interrelations between micro- and macro-organisms are also revealed. The course provides basic information about viruses - their classification, replication strategy and clinical manifestations. Labs will give understanding how are handled most live models used in virology and standards for work with pathogens in laboratory environment.

**Requirements for enrolment: NO**

**Programme:** B.Sc. in Biology BLB010216

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C083 | Systematics of algae and fungi | English | BS | Winter | 6 | 23 | | 22 | Prof. Maya P. Stoyneva, PhD, DrSc | mstoyneva@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This **compulsory course** is oriented towards students in Biology (part-time training). It provides data on the structure, reproduction, distribution and classification of algae and fungi (incl. lichenized fungi) as significant components of ecosystems and their position in the systems of organisms. The course is of theoretical-applied character and provides basic knowledge on the cytology, morphology, physiological, biochemical and genetic peculiarities, reproduction and life cycles, bases of ecology and distribution, evolution and phylogeny of the main taxonomic groups of algae and fungi and their role in Nature. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E228 | Mycology | English | BS | Summer | 3 | 15 | | 8 | Assoc. Prof. Blagoy Uzunov, PhD | buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is an **elective course** for students in part-time education. The students will learn the most important representatives of the wild-growing fungi in Bulgaria, their edible, poisonous and threatened species and with measures for conservation of fungal resources. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E106 | Medicinal algae and fungi | English | BS | Summer | 3 | 15 | | 8 | Prof. Maya P. Stoyneva, PhD, DrSc | mstoyneva@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a **elective course for students** in part-time education. It provides knowledge on the main types of algal products and biologically-active compounds produced by cyanoprokaryotes and other eukaryotic algae, as well as on fungal toxins and secondary lichen metabolites. Additionally, data on the application of algae, fungi and lichens in both traditional and modern medicine and pharmacy and related with them food, cosmetic and perfumery industry are provided, together with the main possibilities and trends in the cultivation of the most important algae and fungi. | | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |

**Programme:** B.Sc. in Molecular Biology BLM020119

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
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| | | | | | | Lectures | Seminars | Practical work | | |
| BL C174 | Biochemistry 1 | English | BS | Summer | 6 | 60 | | 30 | Assoc. Prof. Dr. Jordan Doumanov<br><br>Assoc.Prof. Dr. Lyuben Zagorchev | doumanov@biofac.uni-sofia.bg<br><br>lzagorchev@biofac.uni-sofia.bg |

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| | | | | | | | | | Assoc.Prof. Dr. Denitsa Teofanova | teofanova@biofac.uni-sofia.bg |
| BL C225 | Biochemistry 2 | English | BS | Winter | 4 | 30 | | 30 | Assoc. Prof. Dr. Jordan Doumanov<br><br>Assoc.Prof. Dr. Lyuben Zagorchev<br><br>Assoc.Prof. Dr. Denitsa Teofanova | doumanov@biofac.uni-sofia.bg<br><br>lzagorchev@biofac.uni-sofia.bg<br><br>teofanova@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** Biochemistry course comprises the structural, functional, bioenergetic, and informational aspects of biochemical processes. The relationship structure-function of major classes of biomolecules (proteins, carbohydrates, lipids and nucleic acids) is discussed with accent on central metabolic pathways, their organisation, energy transformation and regulation. The basic principles of expression and transfer of genetic information are explained through the processes of biosynthesis of DNA (replication), biosynthesis of RNA (transcription), and protein synthesis (translation) in prokaryotic and eukaryotic organisms. The use of biochemical approaches to deeply understand other fundamental (molecular biology, pharmacology, human physiology, genetics, etc.) and applied (drug design, clinical laboratory, etc.) biosciences is demonstrated with appropriate examples. The laboratory exercises illustrate and extend the lectures, creating the practical skills necessary for the future professional realization of students. This compulsory course is oriented towards students in Molecular Biology. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C337 | Biocatalysis | English | BS | Winter | 8 | 45 | 15 | 30 | Prof. Dr. Svetla Petrova | spetrova@biofac.uni-sofia.bg |

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| | | | | | | | | | Assist. Prof. Dr. Kirilka Mladenova | k_mladenova@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** The purpose of Biocatalysis course is to integrate knowledge of biochemistry, bioorganic chemistry and molecular biology in order to throw a light on the relationship between the enzyme protein structure, cofactors, kinetics, catalytic strategies and diversity of regulatory mechanisms. The lectures discuss the current concepts of the molecular mechanism of enzyme-catalysed reactions in their cell and metabolic context as well as the possibilities to apply enzyme catalytic strategies for creating new biocatalytic models. Special attention will be paid to the multifunctional enzymes, metalloenzymes, mechanoenzymes, pseudoenzymes, as well as the enzymes involved in cell signalling and transport across the membranes. Topics, as behaviour of certain enzymes in non-aqueous media, enzyme nanotechnologies and enzyme synthesis of important biological products and pharmaceuticals, will demonstrate the advanced enzyme applications. This compulsory course is oriented towards students in Molecular Biology.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C368 | Molecular immunology | English | BS | Summer | 7 | 60 | | 30 | Assoc. Prof. Dr. Ivanka Tsacheva<br><br>Assist. Prof. Dr. Ginka Nikolova | itsacheva@biofac.uni-sofia.bg<br><br>ginka.nikolova@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** This immunology course presents the organization of a functional immune system with its molecular mechanisms of innate and adaptive immunity. A comprehensive view of the development of T- and B-lymphocytes is presented altogether with the molecular mechanisms of generation of the huge diversity of their antigen receptors. The biochemical characteristics of humoral and cell immunity are discussed as well as antigen recognition by B-cell and T-cell receptors, antigen presentation to T lymphocytes, the major histocompatibility complex and its functions. The course contains a full description of the effector mechanisms of humoral and cell-mediated immune response. The laboratory practice complements the lectures with appropriate immunology techniques like immunoprecipitation, ELISA, immunoblotting, RIA, purification of immunoglobulins etc. This compulsory course is oriented towards students in Molecular Biology (regular education).

| Requirements for enrolment: NO | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C286 | Molecular biology | English | BS | Summer | 6 | 60 | | 30 | Assoc. Prof. Dr. Ivelin Panchev | ijpanchev@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course in Molecular Biology discusses the processes of replication, transcription and translation in prokaryotes and eukaryotes with an accent on the recent knowledge on their regulation and differences. It also considers the molecular mechanisms of: nuclear transport; protein sorting; types of posttranslational modifications; cell-to-cell signalling and signal transduction; cell adhesion; program cell death. Practices introduce students to the basic methods for experimental work with DNA and proteins – PCR; DNA and 2D PAAGE electrophoresis; preparation of competent cells and transformation. This compulsory course is oriented towards students in Molecular Biology and Biology (regular education). | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C255 | Human Physiology 1 | English | BS | Winter | 4 | 30 | | 30 | Lectures: Prof. Dr. Hristo Gagov<br><br>Practicals: Assist. Prof. Dr. Iliana Sazdova | hgagov@uni-sofia.bg<br><br>i.sazdova@biofac.uni-sofia.bg |

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|---|---|---|---|---|---|---|---|---|---|---|
| BL C296 | Human Physiology 2 | English | BS | Summer | 6 | 45 | | 45 | Lectures: Prof. Dr. Hristo Gagov<br><br>Practicals: Assist. Prof. Dr. Iliana Sazdova | hgagov@uni-sofia.bg<br><br>i.sazdova@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** This course includes knowledge in the fields of nature and regulation of all basic physiological functions in human – resting membrane potential, generation and propagation of action potential, muscle contraction, synaptic transmission, processes in CNS and functions of its divisions, sensory systems, blood and body fluids physiology, circulation, breathing and respiration in the lungs and tissues, digestion, metabolism, thermoregulation, excretion, hormonal regulation. Special attention is paid on the cellular and molecular mechanisms of physiological processes and their pharmacology. The course aims to give knowledge on the basis of vital processes, as well as on their complex and cross-linked regulation and dynamic in humans. Basic knowledge in the fields of Human Anatomy, Cell Biology and Biochemistry will be helpful.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C041 | Basics of algology and mycology | English | BS | Winter | 4 | 15 | | 30 | Prof. Maya P. Stoyneva, PhD, DrSc | mstoyneva@uni-sofia.bg |

**Short description of the course (in the language of instruction):** This **compulsory course** is oriented towards students in Molecular Biology (regular education). Students receive information on the structure, reproduction and bases of the classification of algae and fungi (incl. lichenized fungi) relevant to their position in the organism world. The course is of theoretical-applied character and provides the necessary minimum of knowledge on the cytology, morphology, physiological, biochemical and genetic peculiarities, reproduction and life cycles, bases of ecology and distribution, evolution and phylogeny of the main taxonomic groups of algae and fungi. Special attention is paid to the application of the knowledge on the structural and functional peculiarities of algae and fungi as interesting and significant model subjects in science and industry. The knowledge provided is absolutely necessary in further courses, related with functional and physiological features of organisms and new molecular data, incl. modern phylogenetic cladograms.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
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| | | | | | | Lectures | Seminars | Practical work | | |
| BL E012 | Medicinal algae and fungi | English | BS | Summer | 3 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc | mstoyneva@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a **elective course for students** in regular education. It provides knowledge on the main types of algal products and biologically-active compounds produced by cyanoprokaryotes and other eukaryotic algae, as well as on fungal toxins and secondary lichen metabolites. Additionally, data on the application of algae, fungi and lichens in both traditional and modern medicine and pharmacy and related with them food, cosmetic and perfumery industry are provided, together with the main possibilities and trends in the cultivation of the most important algae and fungi. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C327 | Molecular virology | English | BS | Winter | 7 | 45 | | 45 | Prof. Dr. Stoyan Shishkov<br><br>Assist. Prof. Dr. Daniel Todorov | sshishkov@biofac.uni-sofia.bg<br><br>dani_todorov@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course provides specialized knowledge of the replication strategy of the various classes of viral genomes of human and animal viruses. The interaction of viruses with cellular factors - enzymes, regulatory proteins, transcription factors and translation factors for the synthesis of viral macromolecules. The training and learning of this program aim to provide students with specific knowledge about the replication features of viruses, as well as the ability to track the mechanism of viral reproduction. The course discusses intermolecular interactions (protein-protein, protein-nucleic acids, protein-lipid) that guide the structuring of viral particles. | | | | | | | | | | |

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C204 | Microbiology 1 | English | BS | Summer | 6 | 45 | | 45 | Assoc. Prof. Dr. Trayana Nedeva | nedeva@biofac.uni-sofia.bg |
| BL C245 | Microbiology 2 | English | BS | Winter | 4 | 30 | | 30 | Assoc. Prof. Dr. Trayana Nedeva | nedeva@biofac.uni-sofia.bg |

**Short description of the course (done in the language of instruction):** This is a theoretical discipline that aims to familiarize students with the current state of microbiology as a basic biological science. The specific features of microorganisms as biological objects, the structural and functional organization of prokaryotes, as well as the specific characteristics of eukaryotic microorganisms are revealed. The structural and functional organisation of the prokaryotic cell as well as the structural organization and functions of the genome, and the types of genetic information transfer mechanisms are discussed. The basic principles of energy and constructive metabolism of microorganisms are also under discussion. Substantial attention is paid to the distribution of microorganisms in the environment and their role in the biogeochemical transformations in the nature, the basic principles of microbial ecology and relationships between them and other living organisms. A systematic review of the major groups of microorganisms and their possible practical application is made as well. The structural and functional organisation of *Archea* is also part of the course. Special attention is paid to the microorganisms-producers of biologically active substances and their use in various branches of industry and environment protection.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E256 | Physiology and biochemistry of microorganisms | English | BS | Summer | 3 | 30 | | 15 | Assoc. Prof. Dr. Trayana Nedeva | nedeva@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** The course Physiology and biochemistry of microorganisms aims to upgrade the fundamental courses in Microbiology and Biochemistry, focusing on the diverse biochemical properties of microorganisms. The physiological-biochemical organization of the microbial cell, the bio-energetic aspects of fermentations, bacterial photosynthesis and microbiological oxidation, as well as mechanisms of biosynthesis and regulation of primary and secondary metabolites are discussed. The course complements and builds on the knowledge and skills, already acquired during the training in general microbiology and biochemistry and promotes the acquisition of new knowledge in the field of biochemical and bio-energetic characteristics of microorganisms. It helps as well in competence development regarding integrated approach to analysing the biology of microorganisms.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E124 | Geological microbiology | English | BS | Summer | 3 | 30 | | 15 | Assoc. Prof. Dr. Michail Iliev | miliev1@biofac.uni-sofia.bg |

**Short description of the course (done in the language of instruction):** Theoretical discipline devoted to bacteria connected with biogeochemical cycles of the elements in the nature. Different biogeochemical cycles of elements as well as the main characteristics of the bacteria involved are under discussion. Different types of the interactions between bacteria are also discussed. The possibilities for practical application of metabolic activities of the microorganisms in environmental protection and bioremediation. The course complements and upgrades the skills acquired in other biological disciplines, which is a prerequisite for increasing students' general biological knowledge.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E093 | Algae and fungi - model objects in molecular biology | English | BS | Winter | 3 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc, | mstoyneva@uni-sofia.bg |

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|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Assoc. Prof. Blagoy Uzunov, PhD | buzunov@uni-sofia.bg |

**Short description of the course (in the language of instruction):** The course aims to introduce students to algae, fungi and lichens used as model objects of molecular biology. Details of the cytological and morphological structure of organisms from these groups and their physiological and biochemical features are presented, along with specific aspects of their life cycles and methods of reproduction, on which a number of modern studies are based. At the same time, the possibilities for practical use in human life of the specifics of these organisms studied in the course are indicated.

**Requirements for enrollment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's e-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E348 | Resistance and Phytoimmunity | English | BS | Summer | 3 | 30 | | 15 | Assoc. Prof. Dr. Miroslava Zhiponova,<br><br>Assist. Prof. Dr. Detelina Petrova | zhiponova@biofac.uni-sofia.bg<br><br>detelina@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):**
The course is developed in both, theoretical and applied aspects. The aim of the course is to acquaint the students with the problems related to plant protection, and the available strategies to resolve them. The main factors causing abiotic and biotic stress, and their impact on plants will be overviewed. There will be discussion on the mechanisms used in plant protection from adverse impacts, as well as in overcoming the negative effects of stress factors. Along with the natural protection are presented also modern biotechnological approaches for supporting plant growth, and for increasing the production of cultural plants for food or feed purposes.

**Requirements for enrollment: NO**

**Programme:** B.Sc. in Biology and Chemistry BLH030117

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C092 | Biodiversity of plants and fungi (part algae and fungi) | English | BS | Summer | 2.5 | 15 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is **a ½ part of a compulsory course in botany (cryptogams, phanerogams and fungi)** for students in pedagogical disciplines related with biology (regular education). Students receive information on the main groups of algae, fungi and lichens and their role in Nature, and usage in human-affairs. The course provides the necessary minimum of knowledge on the structure, reproduction and bases of the classification of algae and fungi (incl. lichenized fungi) relevant to their position in the organism world. The course is of theoretical-applied character. The knowledge provided is absolutely necessary in further courses, related with functional and physiological features of organisms and their ecology and biodiversity. The course ensures not only achievement of fundamental, basic theoretical knowledge but also of competence in identification of field material. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

**Programme:** B.Sc. in Biotechnology BLT040117

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |

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| BL E044 | Applied Algology | English | BS | Summer | 3 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a elective course for students in regular education. It has a theoretical-applied character. The main accents in the theoretical part are related with the most used algae and their metabolites in the practice of human affairs, incl. biotechnologies. Important part of the course is focused on algae and their products as food and medicinal sources, their role as energetic sources and use in modern biodiesel production, etc. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C257 | Biotechnological methods in ecology | English | BS | Winter | 4 | 45 | | 30 | *Lecturers:* Prof. Yana Topalova, PhD, DSc<br><br>Assoc. Prof. Irina Schneider, PhD<br><br>Assoc. Prof. Yovana Todorova, PhD | ytopalova@uni-sofia.bg |

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| | | | | | | | | | *Practical work:* Assist. Prof. Mihaela Belouhova, PhD | |

**Short description of the course (done in the language of instruction):** The main highlights of the course systematize the management approaches for the implementation of biotechnological methods to protect and restore the ecological balance in the nature. Built on a modular principle, the course includes: a/ introduction in specific area and terminology of environmental biotechnology; b/ basis of wastewater treatment processes and technologies; c/ bioremediation of polluted resources; d/ utilization of industrial, agricultural and household wastes by aerobic and anaerobic biotechnological processes; e/ biotech alternatives in agriculture and specific industries with a view to minimizing waste, use of new energy sources and future sustainable development; f/ specific control in environmental biotechnological processes.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C195 | Microbiology | English | BS | Winter | 3.5 | 30 | | 30 | Assoc. Prof. Dr. Trayana Nedeva | nedeva@biofac.uni-sofia.bg |
| BL C195 | Microbiology | English | BS | Summer | 4.5 | 45 | | 30 | Assoc. Prof. Dr. Trayana Nedeva | nedeva@biofac.uni-sofia.bg |

**Short description of the course (done in the language of instruction):** Theoretical discipline aimed to familiarize students with the current state of microbiology as a basic biological science. The specific features of microorganisms as biological objects, the structural and functional organization of prokaryotes as well as the typical characteristics of eukaryotic microorganisms are revealed. The basic principles of constructive and energy metabolism of microorganisms; the genome organization and the specific mechanisms of transfer of genetic material are discussed. Special emphasis is given to the microbial diversity and distribution in the environment and their role in biogeochemical cycles in nature. The course displays as well the basic principles of microbial ecology and microbial interaction with other living organisms. A systematic overview of

the main groups of microorganisms and their basic practical application is foreseen. Information about microorganisms-producers of biologically active substances is given and their use in various industries and environmental protection is outlined. The course complements and upgrades the competence and skills gained during training in organic chemistry, biochemistry and genetics.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's e-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C235 | Ecology and Environmental Protection | English | BS | Summer | 5 | 45 | | 15 | Assoc. Prof. Ivan Traykov | itraykov@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** Ecology is a bio-science that studies the interaction between organisms and the environment in which they live, both biotic and abiotic. It analyses the structure, function and productivity of the supra-individual bio-systems - populations, communities and ecosystems. The course presents modern population ecology as an interesting and dynamic field. Central in the course is to give an understanding of the abiotic and biotic ecological mechanisms that determine the distribution and abundances of populations in nature. The course introduces central theories within population ecology which include the importance of abiotic factors, competition, predation, herbivory, dispersal, diseases and harvesting strategies for fluctuations in population sizes. The course also deals with community and ecosystem theories, including structure and temporal dynamics (succession) of ecological communities, community patterns of species richness and diversity, food webs and trophic interactions, data analysis methods. The second part of the course deals with environmental protection/management and sustainable development. Environmental management addresses hot topic issues such as global warming, pollution, deforestation, soil erosion, landfills, or depletion of Earth's natural resources. The topics will introduce students to the biological effects of air, soil and water pollution, and will explore methods for minimizing pollution effects and their negative impacts.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's e-mail |
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| | | | | | | Lectures | Seminars | Practical work | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| BL C185 | Plant Physiology | English | BS | Winter | 6 | 60 | | 45 | Assoc. Prof. Dr. Ganka Chaneva,<br><br>Assoc. Prof. Dr. Zhenya Yordanova,<br><br>Assoc. Prof. Dr. Miroslava Zhiponova | jiordanova@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** Plant Physiology is an integrative, theoretical and applied discipline studying plant metabolism, growth and development. The course in Plant Physiology introduces the current ideas about the mechanisms of physiological and biochemical processes in plants. The topics include: ultrastructure of plant cell - organelles and functions, main physiological processes - water balance; mineral nutrition; photosynthesis; respiration; biosynthesis of metabolites and their movement through the plant; growth and development; stress responses and adaptation, etc.
The practical classes provide the opportunity students to acquire the necessary skills for plants objects; for the methods studying physiological processes in plant model systems; for performing in-depth analyses and discussing the results.
The course of Plant Physiology complements and builds on students' knowledge acquired in other basic and applied disciplines such as Biochemistry, Cytology, Anatomy and Morphology of Plants, etc. The course contributes to the student improvement into professionals with good theoretical and practical training.

**Requirements for enrollment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s' s name** | **Lecturer/s's e-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C298 | Plant Cell and Tissue Cultures | English | BS | Summer | 4 | 30 | | 30 | Assoc. Prof. Dr. Zhenya Yordanova, | jiordanova@biofac.uni-sofia.bg |

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| | | | | | | | | | Assist. Prof. Desislava Mantovska | d_mantovska@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** Plant Cell and Tissue Cultures is a discipline gaining wider practical application nowadays. Students receive some basic knowledge about the initiation of sterile plant cultures, the influence of culture media, sterilization, type of explant, cultivation conditions, physiological characteristics etc., of the in vitro-grown plants. There are also studied the application of the basic types of in vitro cultures for in vitro selection; the various stages of micropropagation (initiation of cultivation, multiplication, rooting and ex vitro adaptation), and the additional factors influencing them. The course makes an overview on the application of plant cell and tissue cultures for scientific purposes; production of pathogen-free plants, application of some selection strategies; production of secondary metabolites for the pharmacy, cosmetics and food industry, as well as the long-term storage of valuable plant material *in vitro*

**Requirements for enrollment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s' s name** | **Lecturer/s's e-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C247 | Introduction to Genetic Engineering | English | BS | Winter | 4 | 30 | | 30 | Assoc. Prof. Dr. Svetoslav Dimov | svetoslav@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** Theoretical and practical discipline aiming to familiarize the students with the basic genetic engineering techniques, and their applications in the biotechnologies as well, such as isolation and manipulation with nucleic acids, DNA fragments cloning into different vector systems, heterologous expression, libraries handling, site-directed mutagenesis and basic transgenesis. As a result of the educational process, it expected that the students have acquired theoretical basic knowledge and competences of the molecular cloning methods, but also manipulating skills during the practicals.

**Requirements for enrollment: NO**

**Programme:** B.Sc. in Biotechnology BLT040217

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C042 | Structure and biodiversity of plants and fungi (part algae and fungi) | English | BS | Summer | 2.3 | 6 | | 8 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course is **1/3 part of a complex botanical compulsory** course for students in Biotechnology (part-time education) and is oriented towards structure and biodiversity of algae and fungi. Data on their morphology and reproduction is provided with special attention on the application of the knowledge on structural and functional peculiarities of algae and fungi in biotechnologies. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| BL E045 | Applied Algology | English | BS | Winter | 3 | 15 | | 8 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is an elective course for students in regular education. It has a theoretical-applied character. The main accents in the theoretical part are related with the most used algae and their metabolites in the practice of human affairs, incl. biotechnologies. Important part of the course is focused on algae and their products as food and medicinal sources, their role as energetic sources and use in modern biodiesel production, etc. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

**Programme:** B.Sc. in Ecology and Environment Protection BLE050119

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E216 | Ecology of algae | English | BS | Summer | 3 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc, | mstoyneva@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a **elective course for students** in regular education. It provides knowledge on the influence of ecological factors on the development and distribution of the algae and on the main algal communities in different biotopes. Special attention is paid to the algal indicators for the state of recent water and land ecosystems and for paleo-reconstructions. Additionally, other aspects of applied algology are discussed (e.g., toxic algae). The main methods used in ecological-algological investigations are introduced. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E064 | Mycology | English | BS | Summer | 3 | 30 | | 15 | Assoc. Prof. Blagoy Uzunov, PhD | buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is an **elective course** for students in regular education. The students will learn the most important representatives of the wild-growing fungi in Bulgaria, their edible, poisonous and threatened species and with measures for conservation of fungal resources. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E054 | Medicinal algae and fungi | English | BS | Summer | 3 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc | mstoyneva@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a **elective course for students** in regular education. It provides knowledge on the main types of algal products and biologically-active compounds produced by cyanoprokaryotes and other eukaryotic algae, as well as on fungal toxins and secondary lichen metabolites. Additionally, data on the application of algae, fungi and lichens in both traditional and modern medicine and pharmacy and related with them food, cosmetic and perfumery industry are provided together with the main possibilities and trends in the cultivation of the most important algae and fungi. | | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| BL E195 | Basics of phytocoenoloical analysis | English | BS | Winter | 3 | 30 | | 15 | Assist. Prof. Kalina Pachedjieva, PhD | kalina.pachedjieva@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** Phytocoenology is the study of the plant communities – their composition and structure, development and distribution as well as relationships with environment. The course is methodologically oriented combining knowledges from botany/floristics, plant ecology and statistics. In the frame of the course the methodologies for sampling and analysing the vegetation data are presented. Students get acquainted with the main stages of phytocoenological analysis for vegetation classification and its importance for identifying plant communities as basis of habitat types' categorization. Computer programs for analysis of vegetation and environmental data are used and material is presented through implementing case studies.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C358 | Waste Management | English | BS | Summer | 5 | 30 | | 30 | Assoc. Prof. Dr. Silvena Boteva | sbboteva@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** The course aims to introduce students to the growing worldwide problem of waste management, including all stages from collection, through temperate storage and transportation until the treatment (recovery and disposal) of waste. The course is consistent with the National Strategy for Waste Management and updated legislation for options of their treatment. It is focused on the basic concepts and principles of waste management and the hierarchy of the priorities of waste treatment. Each of the priorities is discussed in details as an opportunity for the recovery of waste, reducing the environmental risk of waste disposal, and the ability to use waste as secondary resources. It will discuss also a number of alternatives to the disposal technology for waste treatment. In the course, students will learn not only the most advanced options for waste treatment, but will become familiar with the ecological and economic impacts of the introduction of newer technologies and approaches for waste treatment. The students will be acquainted with national and European legislation relating to issues of collection, transport and treatment of solid waste.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C235 | Ecology | English | BS | Winter | 7 | 45 | | 45 | Assoc. Prof. Ivan Traykov | itraykov@biofac.uni-sofia.bg |

**Short description of the course (done in the language of instruction):** Ecology is a bio-science that studies the interaction between organisms and the environment in which they live, both biotic and abiotic. It analyses the structure, function and productivity of the supra-individual bio-systems - populations, communities and ecosystems. The course presents modern population ecology as an interesting and dynamic field. Central in the course is to give an understanding of the abiotic and biotic ecological mechanisms that determine the distribution and abundances of populations in nature. The course introduces central theories within population ecology which include the importance of abiotic factors, competition, predation, herbivory, dispersal, diseases and harvesting strategies for fluctuations in population sizes. The course also deals with community and ecosystem theories, including structure and temporal dynamics (succession) of ecological communities, community patterns of species richness and diversity, food webs and trophic interactions, data analysis methods.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's e-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C256 | Environmental Protection | English | BS | Summer | 4 | 30 | | 30 | Assoc. Prof. Ivan Traykov | itraykov@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** Environmental protection/management addresses hot topic issues such as global warming, pollution, deforestation, soil erosion, landfills, or depletion of Earth's natural resources. The topics will introduce students to the biological effects of air, soil and water pollution, and will explore methods for minimizing pollution effects and their negative impacts. Air pollution deals with the main chemical (greenhouse gases, ozone depleting gases, smoke forming gases and fine particular matter) and physical (noise, light and microwaves) pollutants and their effects on human, animal and plant health. Water pollution is also one the main environmental issues that we are facing. The course addresses some of its topics to elucidate: what causes water pollution, what are its effects, and what are the possible solutions to prevent water pollution? Soil erosion and soil pollution is the next problem of environmental management, which is discussed

in the course. The health of soil is a primary concern to our community in terms of maintains high agriculture productivity and high natural biodiversity. And finally, the course focuses on the relationships between science, management and policy, while providing scientific understanding of environmental problems and their solving.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s' s name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E012 | Ecological footprint | English | BS | Winter | 3 | 30 | | 15 | Assoc. Prof. Dr. Silvena Boteva | sbboteva@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** The concept of the ecological footprint is a modern and increasingly used approach to assessing the impact of man on the environment. Students will get acquainted with the direct and indirect impact of various activities on the environment. The course focuses on the different types of fingerprints, the ways to calculate them and the measures to reduce the impact on the environment. The footprints (ecological, carbon and water) will be considered in detail depending on the consumed resources and the emitted emissions and depending on the branches (plant growing, animal breeding, industrial sectors, etc.). Students will also be introduced to the footprints left by various events, the activities of companies, as well as their individual footprint. In the practical classes, students will be able to calculate the various fingerprints, make comparisons and analyzes of the data obtained.

**Requirements for enrollment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E124 | Aquaculture | English | BS | Winter | 3 | 30 | | 15 | Assoc. Prof. Dr. Eliza Uzunova | euzunova@uni-sofia.bg |

**Short description of the course (in the language of instruction):** The course introduces the basic concepts and principles underlying the processes of cultivation of marine and freshwater organisms. It tracks the historical development of aquaculture - from its origins in ancient China to the present day. Students are acquainted with up-to-date statistics on world trends in aquaculture development, focusing on the main species in this sector - salmonid and cyprinid fishes. The course gives also a brief overview of the main groups of organisms that are cultivated in aquatic ecosystems - fish, algae, molluscs and crustaceans. The potential impacts of aquaculture on the environment are addressed in the light of global warming and water scarcity. Students will have the opportunity to get acquainted with the work in a re-circulating aquaculture system (RAS) and small pond farm as well.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E135 | Ichthyology and Fish Conservation | English | BS | Summer | 3 | 30 | | 15 | Lectures: Assoc. Prof. Dr. Eliza Uzunova;<br><br>Practical work: Dr. D. Rozdina | euzunova@uni-sofia.bg |

**Short description of the course (in the language of instruction):** Course is an integrated approach to fish biology from a physiological and ecological viewpoint. The course is built on a general background of fish diversity and environmental adaptations while discussing anatomy, physiology, ecology, behaviour. It also be reviewed the fundamentals of fish design and physiological adaptation to environment that contributes to remarkable success of fishes to survive and disperse. The course aims to increase familiarity with evolutionary history and taxonomic diversity of fishes. To improve understanding of the basic physiological and behavioural adaptations that fishes use to carry out their life cycle. To enhance student's skills at collecting and identifying local fish species. To expose to some of the issues surrounding the conservation of fish biodiversity in the environment. To introduce you to some of the quantitative techniques used in describing fish biology. Lectures will include slide and video shows of fishes from around the world and descriptions of what it is like to do field science. The lecture cycle will present and discuss examples of activities that have contributed to the conservation of fishes, carried out by both the state and non-governmental sectors. Laboratory exercises will include methods in fish anatomy, identification fish species, age determination. Field trips with aim local fish collection and also to the fish collection at the National Museum of Natural History will broaden the perspective of the course.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E205 | Bioinvasions | English | BS | Summer | 3 | 30 | | 15 | Assoc. Prof. Eliza Uzunova;<br><br>Assoc. Prof. Rosen Tzonev;<br><br>Dr. Ilija Gjonov | euzunova@uni-sofia.bg<br><br>tzonev@biofac.uni-sofia.bg<br><br>gjonov@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course Bioinvasions synthesizes current knowledge of the ecology and economics of biological invasions, providing an in-depth evaluation of the science and its implications for managing the causes and consequences of one of the most pressing environmental issues facing humanity today. The introduction of pests, predators, and competitors into many ecosystems has disrupted the benefits they provide to people, in many cases leading to the extirpation or even extinction of native species. This course includes: 1. Terminology and basic concepts for the invasive process; 2. The main drivers of bioinvasions - the growth of world trade, global transport and travel, habitat conversion and land-use intensification, and climate change; 3. Biology and ecology of the invasive species occurring in the terrestrial and aquatic ecosystems; 4. Consequences for ecosystem functioning human health and economic activity. 5. Legal framework related to invasive and alien species and 6. Measures to prevent and limit the invasion and spread of invasive species. In the course are discussed the options for improving assessment and management of invasive species risks, and especially needs for achieving the international cooperation. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| BL C225 | Microbiology | English | BS | Winter | 6 | 45 | | 45 | Assoc. Prof. Dr. Trayana Nedeva | nedeva@biofac.uni-sofia.bg |
| **Short description of the course (done in the language of instruction):** The course of Microbiology and microbiological methods for treatment covers the study of the morphological and structural organization of prokaryotes and specific features in their energy metabolism. It also provides basic knowledge about filamentous fungi and yeasts as objects of microbiology. The distribution of microorganisms in nature, the impact of environmental factors on their development, the interactions that occur between different microbial populations and among populations of microorganisms and other organisms is discussed. The role of microbes in the biogeochemical cycles in nature and their use in pollutants treatment and bioremediation of aquatic and terrestrial ecosystems is outlined. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

**Programme:** B.Sc. in Ecology and Environment Protection BLE050219

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E248 | Ecology of algae | English | BS | Summer | 3 | 15 | | 8 | Prof. Maya P. Stoyneva, PhD, DrSc, | mstoyneva@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a elective course for students in part-time education. It provides knowledge on the influence of ecological factors on the development and distribution of the algae and on the main algal communities in different biotopes. Special attention is paid to the algal indicators for the state of recent water and land ecosystems and for paleo-reconstructions. Additionally, other aspects of applied algology are discussed (e.g. toxic algae). The main methods used in ecological-algological investigations are introduced. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E238 | Mycology | English | BS | Summer | 3 | 15 | | 8 | Assoc. Prof. Blagoy Uzunov, PhD | buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is an **elective course** for students in part-time education. The students will learn the most important representatives of the wild-growing fungi in Bulgaria, their edible, poisonous and threatened species and with measures for conservation of fungal resources. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E228 | Medicinal algae and fungi | English | BS | Summer | 3 | 15 | | 8 | Prof. Maya P. Stoyneva, PhD, DrSc | mstoyneva@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a **elective course for students** in part-time education. It provides knowledge on the main types of algal products and biologically-active compounds produced by cyanoprokaryotes and other eukaryotic algae, as well as on fungal toxins and secondary lichen metabolites. Additionally, data on the application of algae, fungi and lichens in both traditional and modern medicine and pharmacy and related with them food, cosmetic and perfumery industry are provided, together with the main possibilities and trends in the cultivation of the most important algae and fungi. | | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |

**Programme:** B.Sc. in Geography and Biology BLG060117

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C092 | Biodiversity of plants and fungi (part algae and fungi) | English | BS | Summer | 2.5 | 15 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is **a ½ part of a compulsory course in botany (cryptogams, phanerogams and fungi)** for students in pedagogical disciplines related with biology (regular education). Students receive information on the main groups of algae, fungi and lichens and their role in Nature, and usage in human-affairs The course provides the necessary minimum of knowledge on the structure, reproduction and bases of the classification of algae and fungi (incl. lichenized fungi) relevant to their position in the organism world. The course is of theoretical-applied character. The knowledge provided is absolutely necessary in further courses, related with functional and physiological features of organisms and their ecology and biodiversity. The course ensures not only achievement of fundamental, basic theoretical knowledge but also of competence in identification of field material. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

**Programme:** B.Sc. in Biomanagement and sustainable development BLU070119

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| BL C154 | Biodiversity of plants and fungi (part algae and fungi) | English | BS | Summer | 3.5 | 15 | | 30 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is **a ½ part of a compulsory course in botany (cryptogams, phanerogams and fungi)** for students in Biomanagement (regular education). Therefore, it provides data on the most important groups and structural peculiarities of the algal and fungal cells, vegetative bodies and reproductive structures in relation with the environmental factors. The accent is on the specific organisms, used in biomonitoring programs, on indicators of anthropogenic impact and conservation important species, used in environmental impact assessments. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E074 | Applied Algology | English | BS | Summer | 3 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a elective course for students in regular education. It has a theoretical-applied character. The main accents in the theoretical part are related with the most used algae and their metabolites in the practice of human affairs, incl. biotechnologies. Important part of the course is focused on algae and their products as food and medicinal sources, their role as energetic sources and use in modern biodiesel production, etc. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C215 | Ecology and environment protection | English | BS | Winter | 6 | 45 | | 45 | Assoc. Prof. Dr. Silvena Boteva | sbboteva@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** Ecology is a bio-science that studies the interaction between organisms and the environment in which they live, both biotic and abiotic. It analyses the structure, function and productivity of the supra-individual biosystems - populations, communities and ecosystems. The course presents modern population ecology as an interesting and dynamic field. Central in the course is to give an understanding of the abiotic and biotic ecological mechanisms that determine the distribution and abundances of populations in nature. The course introduces central theories within population ecology which include the importance of abiotic factors, competition, predation, herbivory, dispersal, diseases and harvesting strategies for fluctuations in population sizes. The course also deals with community and ecosystem theories, including structure and temporal dynamics (succession) of ecological communities, community patterns of species richness and diversity, food webs and trophic interactions, data analysis methods. The second part of the course deals with environmental protection/management and sustainable development. Environmental management addresses hot topic issues such as global warming, pollution, deforestation, soil erosion, landfills, or depletion of Earth's natural resources. The topics will introduce students to the biological effects of air, soil and water pollution, and will explore methods for minimizing pollution effects and their negative impacts.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
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| | | | | | | Lectures | Seminars | Practical work | | |
| BL E256 | Bioinvasions | English | BS | Summer | 3 | 30 | | 15 | Assoc. Prof. Eliza Uzunova;<br><br>Assoc. Prof. Rosen Tzonev; | euzunova@uni-sofia.bg<br><br>tzonev@biofac.uni-sofia.bg |

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| | | | | | | | | | Dr. Ilija Gjonov | gjonov@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** The course Bioinvasions synthesizes current knowledge of the ecology and economics of biological invasions, providing an in-depth evaluation of the science and its implications for managing the causes and consequences of one of the most pressing environmental issues facing humanity today. The introduction of pests, predators, and competitors into many ecosystems has disrupted the benefits they provide to people, in many cases leading to the extirpation or even extinction of native species. This course includes: 1. Terminology and basic concepts for the invasive process; 2. The main drivers of bioinvasions - the growth of world trade, global transport and travel, habitat conversion and land-use intensification, and climate change; 3. Biology and ecology of the invasive species occurring in the terrestrial and aquatic ecosystems; 4. Consequences for ecosystem functioning human health and economic activity. 5. Legal framework related to invasive and alien species and 6. Measures to prevent and limit the invasion and spread of invasive species. In the course are discussed the options for improving assessment and management of invasive species risks, and especially needs for achieving the international cooperation.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C317 | Water resources management | English | BS | Winter | 5 | 45 | | 30 | Prof. Yana Topalova, PhD, DSc<br><br>*Practical work:* Assist. Prof. Ivaylo Yotinov PhD | ytopalova@uni-sofia.bg |

**Short description of the course (done in the language of instruction):** This course provides the basic principles of management of waters as a strategic natural and economic resource. In consistent view, the main topics of course present the legislation base of management - regulations for the control of natural, drinking and waste waters, basic principles of self-purification and water treatment, organization and elements of state-regulated and scientific control of water quality.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E175 | Biological oceanography | English | BA/BS | Winter | 3 | 30 | | 15 | Lectures: Assist. Prof. Desislava Rozdina, PhD | rozdina@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The students are introduced to the basics of the biological oceanography and to the general information about the World Ocean. The physical and chemical characteristics of the saltwater basins are considered as a basis for bio-productivity and zonation of the ongoing biological processes. The major marine communities and their interaction with the abiotic and biotic factors are considered in the context of the anthropogenic influence and the global climate changes. It is justified the need of sustainable utilization of the live marine resources (mainly fish) in the different regions of the World Ocean. Special attention is paid to the identical problems of the Black Sea ecosystem. After completion of the course, the students will have knowledge about the status of the World Ocean and the anthropogenic influence (fishery, agriculture and forestry, energy, transport, industry) on its biological resources. Students will become familiar with methods for marine ecosystems research and for the management of biological resources under various anthropogenic pressures. | | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C235 | Microbiology | English | BS | Winter | 5 | 45 | | 30 | Assoc. Prof. Dr. Ventzislava Petrova | vpetrova@biofac.uni-sofia.bg |
| **Short description of the course (done in the language of instruction):** The course of Microbiology provides knowledge on morphological, structural and functional organization of microorganisms. It offers an overview of microbial metabolism with special emphasis on energy transformation. Microbial growth and development, and the methods for their control through physical and chemical factors are discussed. The presented knowledge is focused on the relationship between microorganisms and other organisms; their distribution in natural environments and | | | | | | | | | | |

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| their role in the biogeochemical cycles of the main elements. The impact of microorganisms to the processes of contaminated soil and water treatment, and their role in the processing and spoilage of food products is given. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E226 | Microbiological monitoring of the environment | English | BS | Summer | 3 | 30 | | 15 | Assos. Prof. Dr. Michail Iliev | miliev1@bio fac.uni-sofia.bg |
| **Short description of the course (done in the language of instruction):** The course "Microbiological monitoring of the environment" presents microorganisms in their natural habitats. It is focused on microbial diversity in different environmental habitats, microbial communities and relationships between them. The basic methodology concerns microbial quantification and study of metabolic activity. Information about the structure and qualitative composition of the microorganisms in aquatic ecosystems is given, and analysis of microbial communities in soil and extreme habitats is performed. The biogeochemical cycles of elements in nature and the role of microorganisms in the transformation of inorganic and organic matter is revealed. The prospects for application of microbial metabolic activity in bioremediation of pollutants of various types are discussed. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

**Programme:** B.Sc. in Biology and English language BLA080119

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| BL C082 | Biodiversity of plants and fungi (part algae and fungi) | English | BS | Summer | 2 | 15 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |

**Short description of the course (in the language of instruction):** This is **a ½ part of a compulsory course in botany (cryptogams, phanerogams and fungi)** for students in pedagogical disciplines related with biology (regular education). Students receive information on the main groups of algae, fungi and lichens and their role in Nature, and usage in human-affairs. The course provides the necessary minimum of knowledge on the structure, reproduction and bases of the classification of algae and fungi (incl. lichenized fungi) relevant to their position in the organism world. The course is of theoretical-applied character. The knowledge provided is absolutely necessary in further courses, related with functional and physiological features of organisms and their ecology and biodiversity. The course ensures not only achievement of fundamental, basic theoretical knowledge but also of competence in identification of field material.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL0801173305 | Methodology of Teaching English as a Foreign Language | English | **BA/BS, MA/MS** | Winter/ summer | 10 | 90 | 15 | 30 | Assoc. prof. Dr. Aneliya Kremenska | akremenska@uni-sofia.bg |

**Short description of the course (in the language of instruction):** The discipline introduces the pedagogical foundation, methods and good practices of Teaching English as a Foreign Language (TEFL). It aims at building all teaching competencies, with a focus on communication and interpersonal skills, organization and planning, classroom management and assessment and coaching. It is specifically designed for the needs of teaching qualification and diploma programmes. The theoretical part of the discipline includes an overview of the contemporary understanding of the foreign language teaching and learning theories, learning styles, multimodality and multiple intelligence. The topics also include the specifics of the teaching profession, and foreign language teaching in particular; the concept and role of communicative competence and the Common European Framework of Reference for Languages. The EFLT methods are briefly presented, and special attention is paid to designing classes

focused on different elements of the communicative competence. Another accent covered is the role and effective use of technology in the language classroom, as well as designing language classes for different degrees of digitalization, including distance, mobile and hybrid education. The theory and practice of analysis, design, development, implementation and evaluation of a foreign language course are viewed as an essential part of the course. The practical work includes working on own teaching portfolio, including 5 tasks and 5 lesson plans. This part of the course focusses on developing practical skills for designing for a given teaching situation, classroom management, assessment and teamwork. The assessment is based on the teaching portfolio, presenting a lesson and a test. All materials and tasks are available via Sofia University E-Learning System, and the course can be delivered in both face-t-face and distance mode.

**Requirements for enrollment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL0801173163 | Information and communication technology in teaching English as a foreign language and working in a digital environment | English | **BA/BS, MA/MS** | Winter | 3 | 15 | 30 | | Assoc. prof. Dr. Aneliya Kremenska | akremenska@uni-sofia.bg |

**Short description of the course (in the language of instruction):** The field of teaching with technology has rapidly developed during the past couple of years. Using the information and communication technologies (ICT) to the best of their potential has become a crucial skill for all teachers, including the teachers of English as a Foreign Language (EFL). The discipline covers all four aspects of this use (ICT for communication, information, environment and assessment), with a strong focus on developing practical skills for introducing adequate ICT for the given context. The course is structured in 12 topics, covering theoretical foundation of e-learning, models and respective terminology. How to choose and evaluate learning materials and information is an introductory topic. An overview of different types of software is made, for designing activities, materials and assessment tasks, including interactive, game-based, and augmented and virtual reality. The specifics of teaching EFL with technologies, such as using online dictionaries, thesauruses, concordances, and others, is also given special attention. Different degrees of digitalizing the language classroom are demonstrated and discussed, and based on analyzing these, practical skills for implementing ICT are developed. Assessment with technology is another focus of the course, building both understanding of assessment types and the technology affordances to support it. The seminars involve practical work on designing own handout, interactive activity, short video for teaching EFL, and assessment task based on e-tests.

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| The marking is based on these elements of the portfolio, as well as presenting them to the rest of the group, and a short test on theory. All materials and tasks are available via Sofia University E-Learning System, and the course can be delivered in both face-t-face and distance mode. |
| **Requirements for enrollment: NO** |

**Programme:** B.Sc. in Agrobiotechnology BLR090116

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E013 | Applied Algology | English | BS | Winter | 3 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a elective course for students in regular education. It has a theoretical-applied character. The main accents in the theoretical part are related with the most used algae and their metabolites in the practice of human affairs, incl. biotechnologies. Important part of the course is focused on algae and their products as food and medicinal sources, their role as energetic sources and use in modern biodiesel production, etc. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |

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| BL C134 | General and Soil Microbiology | English | BS | Summer | 9 | 45 | | 45 | Assoc. Prof. Dr. Ventsislava Petrova | vpetrova@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** The course is designed for students of bachelor degree program Agrobiotechnology. The program includes selected topics of general and soil microbiology. Subjects covered in the section "General Microbiology" are morphology, physiology, genetics of microorganisms and mechanisms of genetic transmission. The course introduces students to the fundamentals of modern microbiology. Allows for the acquisition of knowledge on the characteristics of the microorganism; structural and functional organization of microbial cell; processes of metabolism and practical application of metabolic abilities; characteristic of prokaryotic genome and the natural variability of induced bacteria and forms of genetic exchange. Specific part focuses on the distribution of microorganisms in the soil. Discusses all the main groups of microorganisms forming soil biota, as discussed in detail their involvement in nutrient cycles, energy flow and soil formation. The course includes a study of the environmental aspects of the biology of the soil: the specifics of soil as a habitat for microorganisms, micro and mezo zones, population ecology and vertical distribution of microorganisms in terrestrial ecosystems, role of soil microbiota for environmental protection. Particular attention is paid to the existing interactions between different organisms in the soil, as well as their application in bioindication of polluted soils.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C144 | Plant Physiology | English | BS | Summer | 9 | 45 | | 45 | Assoc. Prof. Ganka Chaneva,<br><br>Assoc. Prof. Zhenya Yordanova,<br><br>Assist. Prof. Miroslava Zhiponova | chaneva@biofac.uni-sofia.bg |

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| **Short description of the course (in the language of instruction):** Plant Physiology is an integrative, theoretical and applied discipline studying plant metabolism, growth and development. The course in Plant Physiology introduces the current ideas about the mechanisms of physiological and biochemical processes in plants. The topics include: ultrastructure of plant cell - organelles and functions, main physiological processes - water balance; mineral nutrition; photosynthesis; respiration; biosynthesis of metabolites and their movement through the plant; growth and development; stress responses and adaptation, etc.<br>The practical classes provide the opportunity students to acquire the necessary skills for plants objects; for the methods studying physiological processes in plant model systems; for performing in-depth analyses and discussing the results. |
| **Requirements for enrollment: NO** |

**Programme:** M.Sc. in Botany (Higher Plants) BLB222119

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C083 | Pre-Diploma Practicum | English | MS | Winter | 15 | | | 90 | Prof. Dr. Dolja Pavlova | pavlova@biofac.uni-sofia.bg |

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| **Short description of the course (in the language of instruction):** The basic aim of this course is to broaden the knowledge of students how to determine higher plants with specialized Bulgarian and foreign floristic literature. The students get familiar with representatives of plant species from mosses, pteridophytes, conifers, monocotyledonous and dicotyledonous families distributed on the territory of the country. Of particular importance is the information about the rare, endangered and endemic plants in the Bulgarian flora. During the course students get familiar with construction of the strictly (indented or bracketed) dichotomous keys. |
| **Requirements for enrolment: YES**<br>**If YES, please describe the specific requirements:** Basic knowledge of higher plant systematics, plant morphology and experience with floristic literature (field guides, floras) is required. |

**Programme:** M.Sc. in Algology and Mycology BLB 212115

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C011 | Theoretical bases of the biodiversity and bioresources of algae and fungi in Bulgaria | English | MS | Winter | 15 | 45 | | 60 | Prof. Nesho Chipev, PhD;<br><br>Prof. Maya P. Stoyneva, PhD, DrSc | mstoyneva@ uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This **compulsory course** for both modules Algology and Mycology of the master program Algology and Mycology. Its aim of the course is to show to students the theoretical bases of one of the most actual topics in recent biology – the biodiversity and with the state and problems of bioresources of algae and fungi in Bulgaria. During the lectures, students get the idea for the general approaches for the understanding of the biodiversity, new concepts and hot spots in spatial and temporal aspects. In the part dedicated to the biodiversity of the algae and fungi in Bulgaria students get involved in the theoretical and practical problems related with the protection of the bioresources in Bulgaria, while during the exercises they will get knowledge on their real distribution in the country. Special attention is paid to the bioresource species in the main types of ecosystems and in protected natural areas. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C021 | Basic algological and mycological methods | English | MS | Winter | 15 | 45 | | 60 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@ uni-sofia.bg<br><br>buzunov@un i-sofia.bg |

**Short description of the course (in the language of instruction):** This **compulsory course** for both modules Algology and Mycology of the master program Algology and Mycology. Its aim is to demonstrate to the students the main field and cameral methods, the specific software products and statistical result processing, which are used in the recent algological and mycological studies. During the field exercises the specific methods for collection and fixation of algae and fungi from different recent ecological groups and from fossil material will be demonstrated. Special attention is paid to the methods for keeping of the living material and its cultivation in laboratory conditions. During the exercises in the laboratory students will achieve self-dependent practical experience in the preliminary processing of the collected samples for work in different algal groups (burning, drying-out, lightening, etc.), in the coloration techniques of various cytological structures for diagnostic purposes and in preparation of different slide types. They will learn to apply different methods for quantitative processing of the samples including different software products. Special attention will be paid to the methods for statistical processing and presentation of the achieved results.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C042 | Taxonomy and evolution of algae | English | MS | Summer | 15 | 60 | | 60 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |

**Short description of the course (in the language of instruction):** This **compulsory course** in the module Algology of the master program Algology and Mycology. It is aimed to prepare specialists, which will work in the field of development of the recent lines in algological investigations, with the main taxonomical principles used in algology for prokaryotic and eukaryotic algae. During the lectures the development and recent lines in algological research, as well as with the main taxonomical principles applied in algology in relation to prokaryotic and eukaryotic algae. In details are shown data on the morphological, cytological and ecological peculiarities of each algal group and of modes of reproduction and life cycles, related with their phylogeny and identification problems. During the seminars the main lines in the evolution of algae and their role in different types of ecosystems. During the practical course students will work with main representatives of each algal group and a special attention will be paid on the self-dependent determination of taxa from different hierarchical levels.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C062 | Taxonomy and evolution of fungi | English | MS | Summer | 15 | 60 | | 60 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a compulsory course in the module Mycology of the master program Algology and Mycology. Its aim is students to receive theoretical and practical knowledge in the field of mycology. The subject of the course are all groups of organisms, which traditionally have been accepted as a subject of the mycological science, namely myxomycetes and their close groups, fungi-like organisms and fungi**.** In the beginning of the course there is a historical overview of the mycological studies is made and the unique character of fungi is discussed together with their position in the organism world, which is delimited by their type of feeding and their main morphological and physiological features. The second part is concentrated on the morphology and life style of fungi: common trend with the other organisms; peculiarities in the body organization, feeding, life cycles, distribution and physiological activity. The third part is dedicated completely to the systematics: classification systems, taxonomically important features and taxonomical procedures, nomenclature. The origin and evolution of fungi are discussed. The fourth part has applicative character and is turned to the industrial importance of fungi. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C052 | Phytoplanktonology and Phytobenthosology | English | MS | Summer | 7 | 30 | | 30 | Prof. Maya P. Stoyneva, PhD, DrSc, | mstoyneva@uni-sofia.bg |

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| | | | | | | | | | Assoc. Prof. Blagoy Uzunov, PhD | buzunov@uni-sofia.bg |

**Short description of the course (in the language of instruction):** This is a compulsory course in the module Algology of the master program Algology and Mycology. Its aim is to demonstrate to the students the main terminology, concepts and theories about the state and development of the phytoplankton and phytobenthos, their relations and with specific contrivances and ecological peculiarities of the representatives of these groups, which are the life bases in the water ecosystems. During the lectures, seminars and practical courses special attention is paid to the most important representatives and to the peculiar methods for phytoplankton and phytobenthos studies (for collection of the material in the field and for cameral processing) and for processing of the results in the floristic, screening and monitoring investigations.

**Requirements for enrolment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Number of hours** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E012 | Algal cultures with bases of aquacultures | English | MS | Summer | 4 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |

**Short description of the course (in the language of instruction):** This is a elective course in the module Algology of the master program Algology and Mycology. The main aim of the course is to introduce the recent methods and criteria for evaluation of different ecosystem types and the most recent methods for their restoration and principles of their management. The basis of the course is the holistic approach with accent on the algal communities as the first level in the food-web chains, which earliest reacts to the changes in the ecosystems. During the exercises students will apply the received knowledge in a way that after a field trip, collecting of the necessary samples from elective sites they will prepare themselves assessments of some different types of ecosystems and will propose the most appropriate methods for their restoration and management

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E052 | Biology and systematics of soil and aerophillic algae | English | MS | Summer | 4 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a elective course in the module Algology of the master program Algology and Mycology. The aim of the course is to show to students the main terms, concepts and theories for the state and development of algae from the ecological group of the aerophyton, with the biological peculiarities of the aerophillic algae, their geographical distribution, as well as with their systematics and diagnostic features. In the course a special attention is paid to the specific methods for studying of algae of this peculiar ecological group (collection in the field, cultivation and cameral teaching) an application of the achieved results in floristic, screening and monitoring studies. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C072 | Ecology of fungi | English | MS | Summer | 4 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |

**Short description of the course (in the language of instruction):** This is a compulsory course in the module Mycology of the master program Algology and Mycology. The aim of the course is to represent to students the modern concepts about the place and role of fungi in the structural and functional organization of ecosystems. In the course theoretical and practical problems of mycology are included. During the practical exercises the details of the main research methods for studying of fungal ecology in forest and herbal ecosystems will be shown to students.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E112 | Phytopathology (fungal pathogenes) | English | MS | Summer | 4 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |

**Short description of the course (in the language of instruction):** This is a elective course in the module Mycology of the master program Algology and Mycology. The aim of the course is to provide theoretical and practical knowledge on plant diseases of herbs and trees. The principles of pathological process, the causative disease agents and ecological preconditions for disease initiation and epiphytotic development, as well as plant immunology are discussed. Certain diseases are represented together with their geographical distribution, specific features, damages and methods for their limitation. During the exercises, skills for identification of the diseases, methods of investigation of pathogenes and their identification and protective methods will be provided.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |

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| BL E132 | Applied lichenology | English | MS | Summer | 4 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a elective course in the module Mycology of the master program Algology and Mycology. The aim of the course is to represent the possibilities for lichen usage in medicine and different industries in historical and modern aspect, in bioconservation and monitoring studies in various natural territories. Special attention is paid to the biocorosion of cultural, historical and natural monuments caused by lichens and methods for their protection. The possibilities for artificial synthesis and cultivation of lichens are discussed. During the exercises students will receive knowledge how to apply in practice the modern lichenometric, lichenoidicative and restoration methods. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C022 | Algological assessment, managing and restoration of ecosystems | English | MS | Summer | 4 | 30 | | 15 | Prof. Maya P. Stoyneva, PhD, DrSc,<br><br>Assoc. Prof. Blagoy Uzunov, PhD | mstoyneva@uni-sofia.bg<br><br>buzunov@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** This is a elective course in the module Algology of the master program Algology and Mycology. The main aim of the course is to introduce the recent methods and criteria for evaluation of different ecosystem types and the most recent methods for their restoration and principles of their management. The basis of the course is the holistic approach with accent on the algal communities as the first level in the food-web chains, which earliest reacts to the changes in the ecosystems. During the exercises students will apply the received knowledge in a way that after a field trip, collecting of the necessary samples from elective sites they will prepare themselves assessments of some different types of ecosystems and will propose the most appropriate methods for their restoration and management. | | | | | | | | | | |

| **Requirements for enrolment: NO** |
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**Programme:** M.Sc. in Applied hydrobiology and aquacultures BLB312121

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C011 | Aquatic toxicology | English | MS | Winter | 6 | 45 | | 30 | Assist. Prof. Desislava Rozdina, PhD | rozdina@uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course follows the contemporary tendencies in the aquatic toxicology. The students are introduced to the eco-toxicological assessment of the xenobiotic's impact on the biological components of the aquatic ecosystems, the study and diagnosis of the pollution of the water bodies with the main groups of toxicants. The course covers the following topics: the main pollution sources in the aquatic ecosystems; classification and characteristics of the polluted waters; contemporary methods for monitoring the behavior of the chemical components in the aquatic environment; the toxic effect of numerous organic and non-organic components in the water environment on the hydrobionts. The practical exercises include: Standard scheme of aquatic-toxicological experiment; acute toxicity testing of certain toxicants on hydrobionts; observation of behavioral responses of aquatic organisms on different toxicants; pathoanatomical analysis of poisoned fish. Completing the course the students will be able to apply the new competences as part of the biomonitoring and biological control of the aquatic ecosystems, solving cases associated with mass fish death with unknown chemical etiology. | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

**Programme:** M.Sc. in Environmental biotechnology BLT212113

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |

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| BL C011 | Environmental biotechnology | English | MS | Winter | 9 | 45 | | 45 | *Lectures:* Prof. Yana Topalova, PhD, DSc<br><br>Assoc. Prof. Irina Schneider, PhD<br><br>*Practical work*: Assist. Prof. Mihaela Belouhova, PhD<br>Assist. Prof. Ivaylo Yotinov, PhD | ytopalova@uni-sofia.bg |
| **Short description of the course (done in the language of instruction):** The main task of this course is to create an integrative view on the role of biotechnology for improvement of environmental quality. It ensures emphasizing knowledge about wastewater treatment processes and technologies, modulation of xenobiotic biodegradation and critical points in pollution control. The accent is put on the modern technologies suitable for different pollutants, the mechanisms of biodegradation of different types of xenobiotics (phenols, nitro- and chlorophenols, phtalates, polycyclic aromatic hydrocarbons), treatment of sludges. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |

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| BL E021 | Drinking waters | English | MS | Winter | 4 | 30 | | 15 | Assoc. Prof. Yovana Todorova, PhD | yovana.todorova@gmail.com |

**Short description of the course (done in the language of instruction):** The course includes the specific area of drinking waters – sources, problems, technologies for obtaining of pure water for drinking and domestic needs, i.e. the way from reservoir to end user. The processing of raw water by appropriate methods for elimination of suspended substances, colouring compounds, metals and microorganisms is summarized. Some specific schemes for production of high-purified water as well as the problems of international standards and legislation are also considered in this elective course.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E052 | Utilization of secondary products | English | MS | Summer | 4 | 30 | | 15 | Assoc. Prof. Irina Schneider, PhD | i.schneider@biofac.uni-sofia.bg |

**Short description of the course (done in the language of instruction):** This elective course has a task to give the students' knowledge on the qualitative and quantitative characteristics of secondary products from different biotechnological industries, on the possibilities and technological ways for their utilization through producing new useful products, either as sources or as consumption goods. Examples of industries that use raw materials like organic products, as well as examples of the use of biomass to energy production are summarized. The economic, ecological and social effect of this approach will be discussed. The main attention will be turn to utilization of secondary products from dairy industry, technologies of composting and anaerobic biotechnologies for biofuel production. Some original approaches will be regarded.

**Requirements for enrolment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |

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| BL E011 | Bioremediation | English | MS | Winter | 4 | 30 | | 15 | *Lectures:* Prof. Yana Topalova, PhD, DSc<br><br>*Practical work:* Assist. Prof. Mihaela Belouhova, PhD<br><br>Assist. Prof. Ivaylo Yotinov PhD | ytopalova@uni-sofia.bg |
| **Short description of the course (done in the language of instruction):** The biological, microbiological, functional and biotechnological approaches in bioremediation as a key strategy for restoration of water sludges and sediments have been studied in this course. The general concepts and principles of the bioremediation have been discussed step by step: 1) biotechnological and economical base and management of the remediation processes; 2) the general bioremediation technologies independent on resources; type of pollution and parameters of the ***in site*** and ***ex site*** processes; 3) post-remediation strategies for monitoring and control. At the time of the course the students develop the real practical bioremediation project and defend this project before specialized jury. | | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's E-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E092 | Genetic and molecular biological methods in environmental biotechnology | English | MA/MS | Summer | 4 | 30 | | 15 | Assist. Prof. Mihaela Belouhova PhD | mihaela.kirilova@uni-sofia.bg |

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| **Short description of the course (done in the language of instruction):** This course aims to provide information on the following two general topics: - Molecular biology in environmental biotechnology: genome organization in prokaryotes, main types of transfer of genetic material in prokaryotes; main types of mutations in bacteria and systems for reparation of DNA injury; regulation of genes' expression; recombinant DNA and gene cloning; molecular phylogeny. - Methods and approaches in environmental biotechnology - molecular methods for monitoring of the dynamic in the natural microbial ecosystems; recombinant technologies; methods for diagnostic of microbial communities. |
| **Requirements for enrolment: NO** |

**Programme:** M.Sc. in Microbiology and microbiological control BLM212119

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E011 | Bioinformatics methods in microbiology | English | MS | Summer | 4 | 30 | 15 | | Assoc. Prof. Dr. Ventzislava Petrova | vpetrova@biofac.uni-sofia.bg |
| **Short description of the course (done in the language of instruction):** This course is a general introduction to Bioinformatics, as a new direction in biological science. It focuses on available computer databases and the possibility of their use in decoding the biological information. Major projects in recent years related to sequencing of various genomic sequences. This led to intensive development of bioinformatics science. The disclosure of these genetic codes allows the acquisition of detailed understanding of the synthesis of proteins, as well as the mechanisms of regulation of all life processes. In this course students will be shown how the use of genetic sequences can lead to much more complete understanding of the biological processes, how the application of such a database would help pharmaceutical and biotech companies in the detection of target sites for new drugs or how to enhance the production efficiency of a given product. Students will be introduced to the basic concepts of Bioinformatics and computational biology tools, such as the most frequently used online tools and resources. The course will include the use of Entrez NCBI's, Blast, PSI-BLAST, ClustalW, Pfam, PRINTS, BLOCKS, Prosite and PDB. An introduction will be made on the possibilities of creating a database, and basic design principles of programming languages. | | | | | | | | | |
| **Requirements for enrolment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's E-mail |
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| | | | | | | Lectures | Seminars | Practical work | | |
| BL E051 | GMOs in food and food products | English | MS | Winter | 4 | 30 | | 15 | Assoc. Prof. Dr. Ventzislava Petrova;<br><br>Assist Prof. Dr. Anna Tomova | vpetrova@biofac.uni-sofia.bg<br><br>aatomova@biofac.uni-sofia.bg |

**Short description of the course (done in the language of instruction):** This course provides basic knowledge on the key features and applications of GMOs in modern agriculture and food industry, and their impact on public health. It is designed to create a better understanding of scientific and safety issues associated with the GMO. Different classifications of foods and food additives derived from GMO are presented, special attention is paid to the fundamental principles for assessing the safety of the GMOs in food. The risks to human health from the use of genetically modified foods are concerned and specific safety aspects of the GMO are discussed. The safety of different genetic markers used for selection, as well as the potential GMO interaction with the intestinal microflora and the immune response is appraised. Information is provided for the concept of the substantial equivalence of GMO. Different groups GMMs and the products derived and applied for human and animal consumption are described. European and international regulations dedicated on the use of genetically modified foods and aiming to protecting human health and the environment are considered.

**Requirements for enrolment: NO**

**Programme:** M.Sc. in Plant Biotechnologies BLT222119

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s' s name | Lecturer/s's e-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C011 | Plant Biotechnologies | English | MS | Winter | 9 | 45 | | 45 | Assoc. Prof. Dr. Zhenya Yordanova,<br><br>Assist. Prof. Desislava Mantovska | jiordanova@biofac.uni-sofia.bg<br><br>d_mantovska@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course discusses the application of plant biotechnologies in agriculture and industry; the space biotechnologies and participation of Bulgaria in various developments for plant cultivation in space stations; basic systems for the cultivation of micro-algae and plants for the preparation of valuable secondary biologically active substances. Students acquire the knowledge of the application of the basic types of *in vitro* cultures for the production of plants resistant to high temperatures, drought, herbicides, etc., as well as the evaluation and management the risk of the use of transgenic plants. The main objective of the course is to learn the practical methods of plant biotechnology (groundless cultivation of plants; *in vitro* cultivation of plants for planting, biomass or for extraction of valuable secondary metabolites used in pharmacy and medicine; the preparation of artificial seeds. It is studied the application of *in vitro* cultures in genetic engineering for the selection of plants resistant to biotic and abiotic stress factors and for improving the quality of agricultural crops. | | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s' s name | Lecturer/s's e-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL E011 | Plant Hormonal Regulation | English | MS | Winter | 4 | 30 | | 30 | Assoc. Prof. Dr. Miroslava Zhiponova | zhiponova@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** The plant hormones are molecules that help plants to adapt towards changes during the development and the surrounding environment. The course will focus on modern scientific strategies for studying the mechanism of plant hormonal action. The acquired knowledge will improve the understanding about how plants function and their importance in the practice. Expected outcomes: Obtaining knowledge about the nature, action and administration of plant hormones that will upgrade courses such as Plant Physiology, Genetics, Biochemistry. Acquisition of skills for working with plants: use of plant model systems, bioinformatics, statistics, molecular biology, genetics, physiology, biochemistry. Ability to conduct research project involving the planning of experiments and respective analysis and interpretation of the obtained results in the form of a scientific publication. Ability for discussion and handling of the terminology and the development of creative thinking. Ability to work in team.

**Requirements for enrollment: NO**

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s' s name** | **Lecturer/s's e-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E012 | Biotechnology of Microalgae | English | MS | Summer | 4 | 30 | | 30 | Assoc. Prof. Dr. Ganka Chaneva | chaneva@biofac.uni-sofia.bg |

**Short description of the course (in the language of instruction):** Course "Physiology and biochemistry of microalgae" focuses on the modern scientific understanding of the physiology of microalgae - taxonomically heterogeneous group of organisms that includes cyanoprokaryotes and eukaryotic algae. The aim of the course is to acquaint students with the unique metabolic processes inherent in microalgae, which are a prerequisite for their application in medicine, pharmacy and industry. Students learn the actual physiological and biotechnological problems of algal mass cultivation - systems for mass cultivation, technologies for biomass production, processing and use of biomass. They study about the usage of algal biomass as a raw material for the production of substances with biologically-active action and its further application in industry. It is emphasized the importance of microalgae as a source of valuable compounds, growth regulators, substances with bactericidal and fungicidal action, and the use of genetically modified species for the purposes of biological control, environmental protection and genetic engineering. The course discusses the role of microalgae in the eutrophication, phytoremediation and their participation in symbiotic associations. The processes of hydrogen and methane production from microalgae and their further use as biofuels are also discussed.

**Requirements for enrollment: NO**

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s' s name | Lecturer/s's e-mail |
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| | | | | | | Lectures | Seminars | Practical work | | |
| BL E022 | Phytoeffectors | English | MS | Summer | 4 | 30 | | 30 | Assoc. Prof. Dr. Miroslava Zhiponova | zhiponova@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course examines under *in vivo* and *in vitro* conditions the physiological role of the main types of phytoeffectors (auxins, cytokinins, gibberellins, abscysic acid, polyamines retardants, herbicides, ethylene and salicylic acid). It is studied their effects on the cell division, formation and growth and shedding of organs and fruits rooting, peace, flower, seed, aging, control of weed infestation, changes in abiotic and biotic stresses. The course complements and significantly builds on knowledge that was previously obtained about the mechanisms of phytohormones' biosynthesis and function, as well as the methods of their application and effects of synthetic growth regulators. The course discusses the phytoeffectors with the greatest impact on the agriculture in terms of their influence on the genotype, stage of development and mode of application. | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s' s name** | **Lecturer/s's e-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E0XX | Application of plant metabolites in cosmetics and perfumery. | English | MS | Winter | 4 | 30 | | 30 | Assoc. Prof. Zhenya Yordanova | jiordanova@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course presents to students advanced concepts on the use of plant metabolites in the cosmetics industry. It examines the major groups of biologically active substances (BAS) that are used in cosmetics and perfumery as well as the mechanisms of interaction of plant metabolites with human cells. Active molecules in sunscreen products as well as the use of plant by-products in cosmetic products are also considered. Biotechnological strategies for the production of BAS from the so-called "plant | | | | | | | | | | |

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| stem cells" and algae are discussed. Practical courses enable students to acquire knowledge to work with different plant model systems and to adopt methods for induction of cell cultures, extraction of essential oils and BAS from plant biomass (essential oil crops, plant stem cells and microalgae), investigation the antioxidant potential of the resulting extracts, formulating a cosmetic product and adding active ingredients into it. |
| **Requirements for enrollment: NO** |

**Programme:** M.Sc. in Plant Physiology BLM282119

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's e-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL C011 | Plant Hormonal Regulation | English | MS | Winter | 4 | 30 | | 30 | Assoc. Prof. Dr. Miroslava Zhiponova | zhiponova@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The plant hormones are molecules that help plants to adapt towards changes during the development and the surrounding environment. The course will focus on modern scientific strategies for studying the mechanism of plant hormonal action. The acquired knowledge will improve the understanding about how plants function and their importance in the practice. Expected outcomes: Obtaining knowledge about the nature, action and administration of plant hormones that will upgrade courses such as Plant Physiology, Genetics, Biochemistry. Acquisition of skills for working with plants: use of plant model systems, bioinformatics, statistics, molecular biology, genetics, physiology, biochemistry. Ability to conduct research project involving the planning of experiments and respective analysis and interpretation of the obtained results in the form of a scientific publication. Ability for discussion and handling of the terminology and the development of creative thinking. Ability to work in team. | | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |
| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's e-mail** |
| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |

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|---|---|---|---|---|---|---|---|---|---|---|
| BL E012 | Biotechnology of Microalgae | English | MS | Summer | 4 | 30 | | 30 | Assoc. Prof. Dr. Ganka Chaneva | chaneva@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** Course "Physiology and biochemistry of microalgae" focuses on the modern scientific understanding of the physiology of microalgae - taxonomically heterogeneous group of organisms that includes cyanoprokaryotes and eukaryotic algae. The aim of the course is to acquaint students with the unique metabolic processes inherent in microalgae, which are a prerequisite for their application in medicine, pharmacy and industry. Students learn the actual physiological and biotechnological problems of algal mass cultivation - systems for mass cultivation, technologies for biomass production, processing and use of biomass. They study about the usage of algal biomass as a raw material for the production of substances with biologically-active action and its further application in industry. It is emphasized the importance of microalgae as a source of valuable compounds, growth regulators, substances with bactericidal and fungicidal action, and the use of genetically modified species for the purposes of biological control, environmental protection and genetic engineering. The course discusses the role of microalgae in the eutrophication, phytoremediation and their participation in symbiotic associations. The processes of hydrogen and methane production from microalgae and their further use as biofuels are also discussed. | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |

| **Course code** | **Course title** (in English) | **Language of instruction** | **Course offered to BA/BS, MA/MS, PhD** | **Semester (winter/ summer)** | **ECTS** | **Workload (hours)** | | | **Lecturer/s's name** | **Lecturer/s's e-mail** |
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| | | | | | | **Lectures** | **Seminars** | **Practical work** | | |
| BL E021 | Transgenic Plants | English | MA | Winter | 4 | 45 | | 15 | Assoc. Prof. Miroslava Zhiponova | zhiponova@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The main objective of the course "Physiology and Ecology of Transgenic Plants" is to acquaint the students of the Master programmes "Plant Biotechnology" and "Plant Physiology" with the main principles and characteristics of plant transformation and physiology of transgenic plants. Modern techniques of plant transformation by means of *Agrobacterium* as well as by the direct biolistic method ("gene gun") are analyzed in the first part of the course. The second part consists of a detailed analysis of main successful examples of plant transformation. Among them special attention deserve the Bt-transformed plants based on introduction of the genes coding for δ-endotoxins (cry-proteins) from *Bacillus thuringiensis*. In addition, transgenic plants tolerant to the photosynthetic herbicide "Athrazine" as well as to the metabolic inhibitor "Glyphosate" ("Round up") are also studied in details. The mechanisms (molecular target) of the herbicide action and the respective chimeric gene constructs for obtaining the required plant tolerance are subject of analysis during the lecture course. Last but not least, the social debate "PRO" and "AGAINST" between Greenpeace and MONSANTO on physiology and ecology of GMO is also present in the last part of the course. Individual presentations from each member of the master's course on respective scientific publications are also envisaged. | | | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's e-mail |
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| | | | | | | Lectures | Seminars | Practical work | | |
| BL E022 | Phytoeffectors | English | MS | Summer | 4 | 30 | | 30 | Assoc. Prof. Miroslava Zhiponova | zhiponova@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course examines under *in vivo* and *in vitro* conditions the physiological role of the main types of phytoeffectors (auxins, cytokinins, gibberellins, abscysic acid, polyamines retardants, herbicides, ethylene and salicylic acid). It is studied their effects on the cell division, formation and growth and shedding of organs and fruits rooting, peace, flower, seed, aging, control of weed infestation, changes in abiotic and biotic stresses. The course complements and significantly builds on knowledge that was previously obtained about the mechanisms of phytohormones' biosynthesis and function, as well as the methods of their application and effects of synthetic growth regulators. The course discusses the phytoeffectors with the greatest impact on the agriculture in terms of their influence on the genotype, stage of development and mode of application. | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |

| Course code | Course title (in English) | Language of instruction | Course offered to BA/BS, MA/MS, PhD | Semester (winter/ summer) | ECTS | Workload (hours) | | | Lecturer/s's name | Lecturer/s's e-mail |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Lectures | Seminars | Practical work | | |
| BL C041 | Application of plant metabolites in cosmetics and perfumery. | English | MS | Winter | 4 | 30 | | 30 | Assoc. Prof. Zhenya Yordanova | jiordanova@biofac.uni-sofia.bg |
| **Short description of the course (in the language of instruction):** The course presents to students advanced concepts on the use of plant metabolites in the cosmetics industry. It examines the major groups of biologically active substances (BAS) that are used in cosmetics and perfumery as well as the mechanisms of interaction of plant metabolites with human cells. Active molecules in sunscreen products as well as the use of plant by-products in cosmetic products are also considered. Biotechnological strategies for the production of BAS from the so-called "plant stem cells" and algae are discussed. Practical courses enable students to acquire knowledge to work with different plant model systems and to adopt methods for induction of cell cultures, extraction of essential oils and BAS from plant biomass (essential oil crops, plant stem cells and microalgae), investigation the antioxidant potential of the resulting extracts, formulating a cosmetic product and adding active ingredients into it. | | | | | | | | | |
| **Requirements for enrollment: NO** | | | | | | | | | | |

***Legend:*** C- Compulsory course; E – Elective course; F – Facultative course