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| Total obligatory hours on week | 23 | 22 |

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| Total facultative hours on week | 3  3 |
## II-nd YEAR

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## III-rd YEAR

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Optional course 3

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Facultative disciplines

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Total facultative hours on week 2 4
IX. Synthetic situation of the subject matters, number of hours and of their weight in the educational plan

Total of subject matters in the educational plan = 61
Total of subject matters (compulsory and complementary) for the credits achievement = 43
Total ore 1876 ore + 84 ore practică = 1960 ore

A. Fundamental discipline = 31; 50.81%  1302 ore;
C. Specialization discipline = 17; 27.86%  252 ore;
D. Complementary discipline = 13; 21.31%  322 ore;
I-st YEAR
PLANT CYTOLOGY, ANATOMY AND MORPHOLOGY

Course coordinator: Lecturer Mihas Craciunas, Ph.D. Candidate
Year: I semester: 1
No. hours course: 2; no. hours laboratory: 2
Discipline type: compulsory; fundamental/basic
ECTS: 5
Prerequisites: -

Aims:
Knowledge of peculiarities, form, dimensions and ultrastructure of plant cell. Knowledge of plant tissue types and peculiarities. Knowledge of vegetative and reproductive organs’ morphology of plants.

Content:
Plant cell; Histology; Peculiarities of plant tissues; Root; Stem; Leaf; Plant reproduction; Flower in Angiospermae, Flower and inflorescence types; Fruit; Seed.

Skills:
Capability to understand and render terms, concepts and principles of Botany. Competence to explore the vegetal world at micro and macroscopic level. Competence to communicate by using terms specific to Botany, to explain the organization/structure of the plants, their ecological preferences, plant-environment interactions, their adaptation to the environment.

Assessment:
The final mark will be calculated based on:
Practical examination 25%
Mid semester examination 25%
Final examination 50%.

References:
Andrei, M., Predan, G.M.I., 2003, Practicum de morfologia și anatomia plantelor, Ed. Științelor Agricole, București
Deliu, C., 2003, Morfologia și anatomy plantelor, Univ. Babeș-Bolyai, Cluj-Napoca
Palade, M. 1998, Botanica farmaceutică vol 1, Ed. Tehnică
SYSTEMATIC OF CRYPTOGRAMS

Course coordinator: Prof. Drăgulescu Constantin Ph.D. –
Year: I semester: 1
No. hours course: 2; no. hours laboratory: 2
Discipline type: compulsory; fundamental/basic
ECTS: 5
Prerequisites –

Aims:
The knowledge and understanding by the students of terms, notions, concepts, and principles specific to Botany, focusing on the systematics of plant kingdom. The presentation of talophytes (inferior plants) phyla’s characteristics and the description of main representatives. Highlighting the role of these plants in nature.

Content:
Classification of plant kingdom; Phylum Bacteriophyta; Phylum Cyanophyta; Phylum Euglenophyta; Phylum Chrysophyta; Phylum Pyrrophyta; Phylum Chlorophyta; Phylum Phaeophyta; Phylum Rhodopyta; Phylum Myxophyta; Phylum Mycophyta; Phylum Lichenophyta; Phylum Bryophyta.

Skills:
Capability to understand and render terms, concepts and principles of the Systematic Botany, of the unity of living world and of the evolution from simple to complex. Capability to explore the vegetal world and to identify the main plant species of the region/country and to perform intellectual and practical activities.

Assessment:
The final mark will be calculated based on:
Practical examination 25%
Mid semester examination 25%
Final examination 50%.

References:
Pop. I. şi colab., 1983, Botanică sistematică (Systematic Botany), Edit. did. şi pedag. Bucureşti
SYSTEMATIC OF PHANEROGAMS

Course coordinator: Prof. Drăgulescu Constantin Ph.D. –
Year: I semester: 2
No. hour’s course: 2; no. hours laboratory: 2
Discipline type: obligatory; fundamental/basic
ECTS: 5
Prerequisites: Plant morphology and anatomy, Systematic of cryptogams

Aims:
The knowledge and understanding by the students of terms, notions, concepts, and principles specific to Botany, focusing on the systematic of plant kingdom. The presentation of cormophytes (superior plants) phyla’s characteristics and the description of main representatives. Highlighting the role of these plants in nature.

Content:
General characteristics of Cormobionta; Phylum Pteridophyta; Phylum Gymnospermatophyta; General characteristics of Phylum Angiospermatophyta. Class Magnoliatae; Class Liliatae.

Skills:
Capability to understand and render terms, concepts and principles of the Systematic Botany, of the unity of living world and of the evolution from simple to complex. Capability to explore the vegetal world and to identify the main plant species of the region/country and to perform intellectual and practical activities

Assessment:
The final mark will be calculated based on:
Practical examination 25 %
Mid semester examination 25%
Final examination 50%.

References:
Drăgulescu, C., 1993, Botanică sistematică și ecologică (Systematic and ecologic botany), Edit. Univ. Sibiu
Drăgulescu, C., 2003, Cormoflora județului Sibiu (Cormoflora of Sibiu County), Edit. Pelecanus Brașov
Pop. I. și colab. 1983, Botanică sistematică (Systematic botany), Edit. did. și pedag. București
ANIMAL CYTOLOGY AND HISTOLOGY

Course coordinator Lecturer DANIEL GHEOCA Ph.D. Candidate
Year I, semester: 1
No. hours course, no. hours laboratory: 28/28
Discipline type: fundamental,
ECTS: 4
Prerequisites: -

Aims:
Study of cell structures, of biochemical processes representing the basis of life's phenomena. Highlighting the universal character of cell system, of its structural and functional complexity, as well as the structural and functional peculiarities of specialized cells. Getting knowledge on the main tissue types and their structure and functioning.

Content

Skills
Ability of understanding and reproducing terms, concepts and principles of cytology and histology, of the life's structural and physiological unity. Correct use of speciality terms. Capacity of distinguishing and identification different cell structures specific to animal cell and different tissue cells, using optical apparatus.

Assessment:
The final mark will be calculated based on mid semester evaluations (15%), evaluation of independent activity consisting of essay preparation (20%), evaluation of the activity during the practices (15%), and final written theoretical examination (50%).

References
Benga, Gh., 1985, Biologie celulară și moleculară, Ed. Dacia, Cluj-Napoca
Gheoca D, Gheoca V. 2004, Practicum de citohistologie, Ed. Mira Design
Course coordinator: Assoc. Prof. ZAMFIR ALEXANDRA Ph.D.
Year, semester: I, 1, EPM; I, 2 BIOLOGIE
No. hours course: 2; no. hours laboratory:
Discipline type compulsory,
ECTS: 5
Prerequisites: Cell Biology, Molecular Cell Biology, Biochemistry

Aims This course presents the fundamental structure of human organs and systems in a format that is suitable for undergraduate students, regardless of academic background or fields of study: ecology, biology, or other allied health professions. This course progresses from the tissues to the organ of human and finally to the total organism like a biological system.

Content
Whereas Part 1 focused mainly on the basic principles of structure of human tissues. Part 2 converges on form and anatomy of nutritional and relational organs of human systems. The risk factors are presented for each anatomical structure and the prevention of anatomical diseases and protection means.

Skills
- recognize morphological and anatomical features of all systems from human body;
- describe anatomical structures of nutrition and relations and control human systems;
- point out which actual risk factors related diseases and modified the structures of human organs;
- perform to act in specific situation (nutrition, breath, circulatory, excretory, mental, endocrinology, motor, diseases) of the first aim or prevention measures of those diseases.

Assessment: The final mark will be calculated based on:
activity during laboratory (%)
practical examination (%)
essay preparation (%)
mid semester examination 25 (%)
final examination 75 (%)

References
APPLIED SPECIAL MATHEMATICS IN BIOLOGY

Course coordinator  Lecturer Amelia Bucur Ph.D.
Year, semester: I,I, the specialization EPM+Biology
No. hours course: no. hours seminary / laboratory: 1C,1S
Discipline type: Fundamental,
ECTS:3
Prerequisites:  Basic knowledge of highschool mathematics.

Aims
Knowing applied mathematical models with applicability in biology and ecology.

Content:
The course contains applications of one and many variable functions, differential equations, mathematical statistics and fractals theory in biology and ecology.

Skills:
Gain the ability to use functions, differential equations and mathematical statistics elements to solve ecology and biology problems.

Assessment:
The final mark is composed by 40% semestrial activity (20% partial exam and 20% activity at course) and 60% the final exam(the final exam has a classical subject style).

References
Amelia Bucur,Applied special mathematics in biology and ecology,Ed.ULBS,2008
II-nd YEAR
Course coordinator: Prof. Drăgulescu Constantin Ph.D. –
Year: II semester: 3
No. hours course: 2; no. hours laboratory: 1; no. hours seminary: 1
Discipline type: compulsory; speciality
ECTS: 5
Prerequisites: Plants biology 2 (for ecologists), Systematic of cryptogams (for biologists), General ecology, Mathematics with applications in biology and ecology

Aims:
The knowledge and understanding by the students of terms, notions, concepts, and principles specific to Phytosociology, mainly those regarding the phytocoenoses’ structure, functions, dynamics and systematics. Getting the students familiarized with the main plant associations from the zones and vegetation levels from Romania.

Content:

Skills:
Capability to understand and render terms, concepts and principles of Phytosociology and to communicate using Phytosociology specific language. Capability to identify the main plant associations within the country and to perform applicative activities. Capability to explore the vegetal world in order to make prognoses and extrapolations on phyto-ceno-diversity.

Assessment:
The final mark will be calculated based on:
Practice examination 25%  
Mid semester examination 25%
Final examination 50%.

References:
Drăgulescu, C., Sîrbu, I., 2002, Practicum de fitocenologie (Practicum of phytocoenology), Edit. Alma Mater Sibiu
Sanda V., 2002, Vademecum ceno-structural privind covorul vegetal din România (Coeno-structural vademecum of Romanian vegetal carpet), Edit. Vergiliu București
PLANT PHYSIOLOGY

Course coordinator: Assoc. Prof. ZAMFIR ALEXANDRA Ph.D.
Year, semester: II, 1
No. hours course: 28 no. hours 28 laboratory:
Discipline type: compulsory, ECTS: 5
Prerequisites: Plant Biology, Chemistry, Biochemistry

Aims: In this course the students in ecology and biology fields will be acquainted with (possible) correlation between the environmental factors and the physiological mechanism of the plant. The course presents also, how these factors influence the nutrition, respiration, production, and in which conditions are positive or negative in the plant life. One of our goal is to correlate the theoretical information with technology in order to protect the primary producers of the ecosystems.

Content: In the first part of the course are presented the cell structure of plant and the physiological role of each one. Then it is presented the interrelation of plant physiological mechanism with environmental factors: water, mineral substances, light, oxygen, another plants. The environmental factors influence the plant physiology in two conditions: quantitative and qualitative.

Skills:
- to understand the influence and the effects, of environmental factors on the plant physiological mechanisms;
- to point out the relationship between structure of cell plants and their functionality, anatomical structure of plant organs and the physiological adaptability in optimal condition;
- to explain the influence of environmental factor in minimal or maximal condition, the tolerance of plant through the physiological mechanisms;
- to integrate and apply his basic knowledge on physiology.

Assessment: The final mark will be calculated based on:
essay preparation (%) -
mid semester examination (%) 20
final examination (%) 80

References
Atanasiu, L., 1984, Ecofiziologia plantelor, Ed. Şt. şi Encicl., Bucureşti
Zamfir Alexandra, 2000, Noțiuni de fiziologie și ecofiziologie vegetală, Ed. Alma Mater din Sibiu
ANIMAL PHYSIOLOGY

Course coordinator: Assoc.Prof. ZAMFIR ALEXANDRA Ph.D.

Year, semester: II, 2
No. hours course: 28 no. hours 28 laboratory:

Discipline type: compulsory,
ECTS: 4

Prerequisites: Cell Biology, Biochemistry, Animal Biology

Aims: In this course the student in ecology and biology fields will be acquainted with (possible) correlation between the environmental factors and the physiological mechanism of the animal. The course presents also how sensitive, neuronal, hormonal, receptors and the movement systems are implicated in steady station, or homeostasis of animal and human organisms.

Content: In the first part of the course are presented the mechanisms of autoregulation in physiological processes. Then is presented sensory system like a part of nervous system, how these receive stimuli from the external and internal environmental. In the third part the course it is explain the role of nervous sistem in the movement, the relation of this with endocrine glands, the movement of different animals, and processes of regulation of body temperature in poikilotherm and homeotherm animals.

Skills
- to understand the influence and the effects, of environmental factors on the animal physiological mechanisms;
- to point out the relationship between structure of animal cell and their functionality, anatomical structure of organs and the physiological adaptability in optimal conditions;
- to explain the influence of environmental factor, like stimuli, the sensibility and specificity of the receptors, nervous systems capacity to process the information and the reflex response of animals.

Assessment: The final mark will be calculated based on:
essay preparation (%) -
mid semester examination (%) 20
final examination (%) 80

References
Ardelean, G., Roșioru, C., 1996, Integrarea și coordonarea organismului animal, Ed.Univ., Baia Mare,
Zamfîr Alexandra, Noțiuni de fiziologie și ecosfiziologie animală, Ed.Alma Mater, Sibiu
PLANT PHYSIOLOGY

Course coordinator Assoc.Prof. ZAMFIR ALEXANDRA Ph.D.

Year, semester: II, 1
No. hours course: 28 no. hours 28 laboratory:

Discipline type compulsory, ECTS: 5

Prerequisites: Plant Biology, Chemistry, Biochemistry

Aims In this course the student in ecology and biology fields will be acquainted with (possible) correlation between the environmental factors and the physiological mechanism of the plant. It is presented also, how these factors influence the nutrition, respiration, production and in which conditions are positive or negative on the plant life. One of our goal is to correlate the theoretical information with technology in order to protect the primary productors of the ecosystems.

Content: In the first part of the course are presented the cell structure of plant and the physiological role of each one. Then is presented the interrelation of plant physiological mechanism with environmental factors: water, mineral substances, light, oxygen, another plants. The environmental factors influence the plant physiology in two conditions: quantitative and qualitative.

Skills
- to understand the influence and the effects, of environmental factors on the plant physiological mechanisms;
- to point out the relationship between structure of cell plants and their functionality, anatomical structure of plant organs and the physiological adaptability in optimal conditions;
- to explain the influence of environmental factor in minimal or maximal condition, the tolerance of plant trough the physiological mechanisms;
- to integrate and apply his basic knowledge on physiology.

Assessment: The final mark will be calculated based on:
essay preparation (%) -
mid semester examination (%) 20
final examination (%) 80

References
Atanasiu, L., 1984, Ecofiziologia plantelor, Ed. Șt. și Encicl., București
Zamfir Alexandra, 2000, Noțiuni de fiziologie și ecofiziologie vegetală, Ed. Alma Mater din Sibiu
VERTEBRATE ZOOLOGY (I)

Course coordinator: Lecturer VOICHITA GHEOCA Ph.D.
Year, semester: II/I
No. hours course: no. hours laboratory: 28/28
Discipline type: compulsory,
ECTS: 5
Prerequisites: Invertebrate zoology (I); Invertebrate zoology (II);

Aims
Study of vertebrates, based on the knowledge of aspects regarding: morphology, structure, development, systematics and phylogeny, distribution, way of life, relations with the environment and other living organisms. Presentation of Earth's fauna diversity, and especially of Romania's fauna. Highlighting the theoretical and practical importance of animal biology study, of the knowledge of the role animals play in nature and man's life.

Content
The course presents information on Chordata – general characters, origin. Cephalochordata – general characterization of a common form (Branchiostoma lanceolatum) – biology, importance. Urochordata – general characters, systematics, biology, importance. Vertebrata – fish and amphibians – morphological and anatomical characterization, origin, adaptations to the environment, principles of classifications, phylogenetic considerations, classification, representatives. The laboratory presents the general characters of the groups by anatomical and morphological study of some representatives.

Skills
Ability of understanding and reproducing specific terms, principles of animal biology, of structural and physiological unity of living world and of evolution from simple to complex. Capacity of identifying the main animal species in the field. Ability of exploring the animal world in order to forecast local diversity based on own observations and experiments.

Assessment:
The final mark will be calculated based on mid semester evaluations (15%), evaluation of independent activity consisting of essay preparation (10%), evaluation of the activity during the practices (25%), and final written theoretical examination (50%).

References
Gheoca, V., 2000, Biologie animală III, Ed. Alma Mater Sibiu
Course coordinator Lecturer VOICHITA GHEOCA Ph.D.

Year, semester: II/IV

No. hours course: no. hours laboratory: 28/28

Discipline type: fundamental, ECTS: 4

Prerequisites: Invertebrate zoology (I); Invertebrate zoology (II), vertebrate zoology (I);

Aims
Study of vertebrates, based on the knowledge of aspects regarding: morphology, structure, development, systematics and phylogeny, distribution, way of life, relations with the environment and other living organisms. Presentation of Earth's fauna diversity, and especially of Romania's fauna. Highlighting the theoretical and practical importance of animal biology study, of the knowledge of the role animals play in nature and man's life.

Content
Amniotic vertebrates – Classis Reptilia, Aves, Mammalia – general characters, evolution, biology, phylogenetic considerations, importance, classification, systematics.

Skills
Ability of understanding and reproducing specific terms, principles of animal biology, of structural and physiological unity of living world, of evolution from simple to complex. Capacity of identifying the main animal species in the field and laboratory. Ability of exploring the animal world in order to forecast local diversity based on own observations and experiments.

Assessment:
The final mark will be calculated based on mid semester evaluations (15%), evaluation of independent activity consisting of essay preparation (10%), evaluation of the activity during the practices (25%), and final written theoretical examination (50%).

References
COMPARATIVE ANATOMY

Course coordinator: Lecturer VOICHITA GHEOCA Ph.D.
Year, semester: II/IV
No. hours course: no. hours seminary / laboratory: 28/14/14
Discipline type specialisation,
ECTS: 3
Prerequisites: Vertebrate zoology I, Vertebrate zoology II

Aims
The study of vertebrates' complex morphological systems' evolution. The placement of anatomical systems in evolutionary context, the study of each major system and the establishment of its evolution, from its appearance to the present structures in the developed groups. To clarify the way these systems co-operate and function as a whole representing life.

Content:
Evolution, phylogeny, palaeontology – comparative anatomy as a science. Short recapitulation of the main taxa. Form and function in vertebrate series. Development: tegument – structure, horny tegument formations; skeleton – cephalic, axial, zone skeleton; musculature – structure and organization; respiratory system – branchyal, pulmo-tegumentary, pulmonary respiration, and other respiratory surfaces; circulatory system – evolution of the heart and the correlation with the respiratory system; digestive system- organization and adaptation to the different trophic regimes; urogenital system – organization and adaptative evolution; nervous system – brain evolution in vertebrates; sensorial structures – structure types and development degree.

Skills
Ability of understanding and reproducing terms, concepts and comparative anatomy's principles, of the living world's structural and physiological unity, of evolution from simple to complex. Capacity of identification of different anatomic structures and establishing the correspondences with the systematically categories.

Assessment: The final mark will be calculated based on mid semester evaluations (20%), evaluation of independent activity consisting of essay preparation (15%), final written theoretical examination (65%).

References
GENETICS (I)

Course coordinator Lecturer VOICHITA GHEOCA Ph.D.
Year, semester: II/IV
No. hours course: no. hours seminary / laboratory: 28/14/14
Discipline type Fundamental,
ECTS: 4
Prerequisites: Animal cytology and histology, General chemistry, Biochemistry

Aims: The knowledge of basic genetic terms, structures and processes involved in inheritance of characters. Knowledge of chromosomal mechanism of heredity, of the Mendel’s laws of heredity, and sources of genetic variability.


Skills:
Understanding and reproduction of genetic terms and principles. Capacity of communication using the genetics specific language, to explain how the genetic material is organised, the mechanisms involved in genetic material replication, gene expression and genetic regulation. The capacity to identify normal and modified genetic structures, of mutations in plants and animals.

Assessment: The final mark will be calculated based on:
practical examination (15%)
essay preparation (10%)
mid semester examination (15%)
final examination (60%)

References:
Coman, N., 1977, Genetica populaţiilor, Univ. "Babeş-Bolyai" Cluj-Napoca
Raicu, P., 1991, Genetica, EDP, Bucureşti
CELL BIOLOGY

Course coordinator: Assoc.Prof ZAMFIR ALEXANDRA Ph.D.
Year, semester: II, 1 (BIOLOGY)
No. 28 hours course; no. 14 hours laboratory; no. 14 hours seminary
Discipline type Optional,
ECTS: 4
Prerequisites: Biochemistry

Aims The students in biology and medicine fields can receive the basic knowledge for another more specialized course: plant and animal physiology, genetic, cell biotechnology. The students can achieve a working knowledge trough describe, explain, integrate and synthesized information about the ultra structure and function of cells, its organelles and bio molecules.

Content
Whereas Part 1 focussed mainly on the basic chemical contents of animal and plant cells. Part 2 converges on prokaryote and eukaryote cells origin. Then are presented eukaryote cells organelles with their molecular structure and their biochemical mechanisms: plasma membrane and tranmembranar transport, ribosome’s and protein syntheses, mitochondrial organelle and Krebs cycle, electron transport chain, chloroplast and photosynthesis, etc;

Skills
- to recognize morphological and molecular of all cell organelles;
- to describe the technology to research the cellular mechanism and their interest in practice;
- to point out that cells are biological systems and the basic units of living organisms.

Assessment: The final mark will be calculated based on:
activity during laboratory (%) -
practical examination (%) -
essay preparation (%) -
mid semester examination 20 (%)
final examination 80 (%)

References
Benga, Gh. 1985, Biologie celulară şi moleculară, Ed. Dacia, Cluj-Napoca
Zamfir Alexandra, 2000, Noţiuni de biologie celulară, Alma Mater, Sibiu
BIOCHEMISTRY (I)

Course coordinator: Assoc. Prof. biochemist Simona OANCEA, Ph.D.
Year, semester: II, III
No. hours course: no. hours seminary / laboratory: 28/28
Discipline type: Fundamental
ECTS: 5
Prerequisites: General Chemistry, Molecular Biology, Microbiology

Aims:
Presentation of bioelements and biomolecules of the living matter.
Enzymes’ mechanism of action and their involvement in biological processes in plants, animals and microorganisms.
Biochemistry of the interactions of organisms with the environment.
Application of analytical methods to study biocomponents isolated from different biological sources.

Content:
Biochemical methods of analysis of the cell constituents.

Skills
In addition of the course and practical activity, the student must know the main biochemical characteristics of cellular chemical constituents, the effects and functions of bio molecules, biochemical communication in living organisms and analytical methods for bio molecules’ identification.

Assessment:
The final mark will be calculated based on:
activity during seminars, essay preparation (20 %)
practical examination (30%)
final examination (50%)

References
LABORATORY TECHNIQUES

Course coordinator Lecturer DANIEL GHEOCA Ph.D. Candidate
Year, semester: II/III
No. hours course: no. hours seminary / laboratory: 28
Discipline type: Speciality,
ECTS: 3
Prerequisites: Cytology and Animals histology, General chemistry

Aims
Acquiring knowledge and practical abilities regarding the main techniques used in speciality labs.

Content

Skills
Ability of understanding and reproducing terms and principles of the main lab techniques. Capacity of using the techniques and interpret the results.

Assessment:
The final mark will be calculated based on mid semester evaluations (25%), evaluation of independent activity consisting of essay preparation (25%), evaluation of the activity during the practical (50%).

References:
Course coordinator: Prof. Drăgulescu Constantin Ph.D. – and Assoc Prof. Schneider Erika Ph.D. –

Year: II semester: 4
No. hours course: 2; no. hours laboratory: 1

Discipline type: Optional; Speciality
ECTS: 5

Prerequisites: Systematic of cryptogams, Systematic of phanerogams, Phytosociology and Romanian vegetation.

Aims:
Getting the students familiarized with the botanical specificity of the Carpathians, with the plants’ adaptations to geographic, climatic, and pedologic conditions in these mountains, with the main Carpathian ecosystems and plants associations and their differential flora depending on the ecological factors specific to each described ecosystem.

Content:
The plants adaptations at mountain ecological factors. The classification of orophytes after plants adaptations at climatic, orographic, geological and pedological factors. Principal ecosystems from the Carpathians. The forests. The mountains, sub alpine and alpine bushes. The grass-plots. The saxicolous phytocoenoses. The springs, lakes and bogs vegetation. The agrocoenoses and weedscoenoses. The protected sites in the Carpathians. The plants with economic value.

Skills:
Capability to understand and render terms, concepts of Plant Ecology applied to mountain habitats. Ability to explore the vegetal world in order to make prognoses and extrapolations concerning mountain phytodiversity, based on observation and experiments. Capability to identify the main mountain plant species.

Assessment:
The final mark will be calculated based on:
Practical examination 25 %
Mid semester examination 25%
Final examination 50%.

References:
Drăgulescu, C., Schneider, Erika, Benedek Ana Maria, 2006, Fitodiversitatea habitatelor din Carpaţii (Phytodiversity of Carpathians habitats), Edit. Univ. "Lucian Blaga" Sibiu
Pârvu, C. şi colab. 1980, Ecosistemele din România (Ecosystems of Romania), Edit. Ceres Bucureşti
Sîrbu, I, Benedek Ana Maria, 2001, Cartea muntelui (The book of the mountain), Edit. Mira design Sibiu
METABOLIC BIOCHEMISTRY

Course coordinator Assoc. Prof. Simona OANCEA, Ph.D.

Year, semester: II, IV
No. hours course: no. hours seminary / laboratory: 28/14
Discipline type: Speciality
ECTS: 5
Prerequisites: General Chemistry, Molecular Biology, Microbiology, Biochemistry I

Aims
Knowledge of essential aspects regarding metabolism, bioenergetics, macroergic compounds.
Knowledge of essential aspects of primary metabolism and metabolic interactions.
Presentation of some mechanisms of metabolic regulation.
Knowledge of quantitative analysis of cellular components. Study of metabolic pathway

Content

Skills
In addition of the course and practical activity, the student must know the main metabolic pathways of saccharides, lipids, proteins, nucleotides, the types of intercellular communication, mineral metabolism, and to determine quantitatively bioactive substances from different biological sources.

Assessment:
The final mark will be calculated based on:
activity during seminaries, essay preparation (20 %)
practical examination (30%)
final examination (50%)

References
ENZIMOLOGY

Course coordinator  Assoc. Prof. biochemist Simona OANCEA, Ph.D.
Year, semester:  II, IV
No. hours course: no. hours seminary / laboratory:  28/14
Discipline type: Speciality
ECTS:  5
Prerequisites: General Chemistry, Molecular Biology, Microbiology, Biochemistry (I)

Aims
Students’ understanding of concepts in enzimology.
Knowledge of the structure of enzymes and their mechanism of action.
Knowledge of essential aspects of chemical and enzymatic catalysis. Classes of enzymes.
Development of students’ ability to use methods of extraction and purification of enzymes.
Determination of enzymatic activity.

Practical applications.
Determination of activity of some enzymes.

Skills
In addition of the course and practical activity, the student must know the structure of enzymes and the mechanism of enzymatic catalysis, the practical applications of enzymes and methods for determination of enzymatic activity.

Assessment:
The final mark will be calculated based on:
activity during seminars, essay preparation (20 %)
practical examination (30%)
final examination (50%)

References
Oancea Simona, Biochimia structurală a produselor alimentare, Editura Universității ”Lucian Blaga” Sibiu, 2002.
ETHNOBIOLOGY

**Course coordinator**: Prof. Drăgulescu Constantin Ph.D. –

**Year**: II semester: 3

**No. hours course**: 1; **no. hours seminary**: 1

**Discipline type**: Facultative; Speciality

**ECTS**: 3

**Prerequisites**: Systematic of cryptogams, Systematic of phanerogams (for biologists), Zoology of invertebrates, General ecology

**Aims**:
Getting the students familiarized with the study object of ethno biology; recapitulation of the main terms and concepts regarding biodiversity, flora, fauna, biocoenosis, ecosystem, habitat; evaluation of a region’s biological potential; introduction of students to the methodology of ethno biological studies using the questionnaires.

**Content**:

**Skills**:
Capability to understand and render terms, concepts and principles of Ethno-botany and Ethno zoology and to explain the folk knowledge about plants and animals based on cultural specificity and local history. Capability to use ethno-botanical and ethno-zoological questionnaires.

**Assessment**:
The final mark will be calculated based on:
Activity during seminars 50%.
Final examination 50%.

**References**:
Băcescu, M., 1961, Păsărilă în nomenclatura și viața poporului român (The birds in the nomenclature and life of romaniians), Edit. Acad. București

Butură, V., 1979, Enciclopedia de etnobotanică românească (Encyclopaedy of romanian ethnobotany), Edit. Științifică și enciclopedică București

Drăgulescu, C., 1992, Botanica populară în Mărginimea Sibiului (Popular botany in Mărginimea Sibiului), Sibiu

Drăgulescu, C., 1995, Botanica populară în Țara Făgărașului (Popular botany in Țara Făgărașului), Edit. Constant Sibiu
III-rd YEAR
Course coordinator: Lecturer Voichita Gheoca Ph.D.
Year, semester: III/V
No. hours course: no. hours seminary / laboratory: 24/14/14
Discipline type: Fundamental, ECTS: 4
Prerequisites: Genetics (I)

Aims:
The knowledge of the main notions of general and population genetics. Reveal the way the genetic material is modified under natural and artificial factors; presentation of principal mutagen factors. Knowledge of principles and laws of population genetics and of genetic diversity investigation means.

Content:

Skills:
Capacity of understanding and reproduction of general and population genetic terms and principles. Capacity of microscopic identification of normal and modified genetic structures; mutants identification in plant and animals.

Assessment: The final mark will be calculated based on:
- practical examination (15%)
- essay preparation (20%)
- mid semester examination (15%)
- final examination (60%)

References:
Coman, N., 1977, Genetica populațiilor, Univ. "Babeș-Bolyai" Cluj-Napoca
Raicu, P., 1991, Genetica, EDP, București
PARASITOLOGY

Course coordinator: Lecturer Daniel Gheoca Ph.D.
Year, semester: III/V
No. hours course: no. hours laboratory: 28/28
Discipline type: Specialisation,
ECTS: 4
Prerequisites: Animal biology (I), Animal biology (II).

Aims
Knowledge of the main groups of parasites, of their hosts and the relations parasite-host, of the interactions between the two groups of organisms, with the implications related to the life cycles' strategies, immunity and specific adaptations. Presentation of general issues of parasitism's, of origins and distribution of parasitic organisms in the animal kingdom.

Content

Skills
Ability of understanding and reproducing terms, concepts and principles of parasitology. Acquiring knowledge related to parasite-host coevolution as a system in equilibrium. Capacity of identification of different classes of parasites and the changes caused by these in their hosts.

Assessment:
The final mark will be calculated based on mid semester evaluations (15%), evaluation of independent activity consisting of essay preparation (10%), evaluation of the activity during the practical (25%), and final written theoretical examination (50%).

References
Nitzulescu V., I. Gherman: 1985 Parazitologie clinica, Ed. Medicala, Bucuresti,
BIOGEOGRAPHY

Course coordinator: DR. DANIELA MINODORA ILIE
Year, semester: III, V
No. hours course: no. hours seminary / laboratory: 14 hours course, 14 hours seminary
Discipline type optional, ECTS: 3
Prerequisites: Plant biology II, Animal biology I, II, III, Ecology, Phytosociology and vegetation of Romania

Aims: Exposure of chorology’s main issues. Presentation of Earth’s and Romania’s biogeographically regionalization


Skills: Knowledge of terms and concepts specific to this science; right use of speciality terms; understanding of fundamental phenomena specific to biogeography, perception of some relations and connections, analytic and synthetic capacity; use of some specific investigations methods, techniques, and instruments; manifestation of a positive and responsible attitude towards the scientific field.

Assessment: The final mark will be calculated based on activity during seminaries (25%) and final examination (75%).

References:
2. BĂNĂRESCU, P., BOȘCAIU, N., 1973, Biogeografie, Ed. Științifică, București
EVOLUTIONISM

Course coordinator: Prof. IOAN SÎRBU Ph.D
Year, semester: III, 5
No. hours course: no. hours seminary / laboratory: 28 hours course, 14 hours seminary
Discipline type: Optional,
ECTS: 4
Prerequisites: Plant Biology, Animal Biology, Genetics, Ecosystems: structure and functions, Population Ecology

Aims:

Content:
Definition and proofs of evolutionary theory, the meaning and scope of evolutionary thinking in science and daily life, genesis and history of the Universe, Earth and life, background and reasons for biodiversity, geochronological scale correlated with life development analysis, forces and mechanisms of evolution, natural selection, adaptation, phylogenetic reconstruction, species and speciation, superior taxa and their significance, origin and evolution of the hominids and of the modern humans.

Skills:
Knowledge of terms and concepts specific to this science; right use of speciality terms; understanding of fundamental phenomena specific to evolutionism, perception of some relations and connections, analytic and synthetic capacity; use of some specific investigations methods, techniques, and instruments; manifestation of a positive and responsible attitude towards this scientific field.

Assessment: Final examination 80%, activity during the seminaries 10%, mid semester examination 10%.

References:
Sîrbu, I., 2008 - Evoluționism (in electronic format, available via internet)
Mustață G., Mustață M., 2001 - Origine, Evoluție și Evoluționism. Ed. „Vasile Goldiș”
University Press, Arad.
University Press, Arad.
ETHOLOGY

Course coordinator: Prof. IOAN SÎRBU Ph.D
Year, semester: III, 6
No. hours course: no. hours seminary / laboratory: 28 hours course, 14 hours seminary
Discipline type: Optional,
ECTS: 4
Prerequisites: Animal Biology (I) and (II), Animal Ecophysiology

Aims:
Study of behaviour as an environmental integration factor, proximal and distal ethological analysis, background, expressions, mechanisms and functions of the different behavioural patterns. Adaptive and evolutionary values of the animal behaviour. Developing skills for description, analysis, explanation and synthesis of different behaviours.

Content:

Skills:
Knowledge of terms and concepts specific to this science; right use of speciality terms; understanding of fundamental phenomena specific to ethology, perception of some relations and connections, analytic and synthetic capacity; use of some specific investigations methods, techniques, and instruments; manifestation of a positive and responsible attitude towards this scientific field.

Assessment: The final mark will be calculated based on activity during seminaries (10%), mid semester examination (10%), and final examination (80%).

References:
Sîrbu, I., 2008 - Etologie - note de curs (available through CD or via www).
HIDROBIOLOGY

Course coordinator: Assoc. Prof. Angela Bănăduc Ph.D. Head of Ecology and Environment Protection Department

Year, semester: II, IV

No. hours course: 28, no. hours laboratory: 28

Discipline type: Compulsory, Specialty

ECTS: 4

Prerequisites: General ecology, Populations ecology, Physical environment (II).

Aims: Underling the knowledges related with the aquatic ecosystems structure and the characteristic processes of these ecosystems. The cognition by the students of the structural and functional of the continental ecological systems, the understanding of the aquatic biocenosis - biotope interactions.

Content: Course: Water as environment for life; Aquatic biotope characteristics; Aquatic communities classification: characterization, adaptations; Structural and functional characteristics of the main types of continental lotic aquatic ecosystems, hyporeic environment, lakes as ecosystems, ponds, swamps; General notions regarding the ecological assessment of the aquatic continental systems; Black Sea ecology.

Laboratory: Particularities of the aquatic ecosystems research; research phases; Water physico-chemical characteristics; Aquatic community’s structure analyse.

Skills: The capacity to understand and reproduce the concepts, terms and principles specific for hydrobiology. The knowledge and understanding of the structures and processes characteristic for the aquatic ecologic systems. The capacity to communicate using the specific terms and concepts, to explain and interpret the way of structuring and functioning of the aquatic ecological systems. The capacity to analyse the aquatic biotope characteristics, the aquatic communities structure (benthos, plankton, ichthyofauna).

Assessment: The final mark will be calculated based on:

practical examination -20% of the final mark
essay preparation - 10% of the final mark
mid semester examination - 10% of the final mark
final examination - 60% of the final mark

References:
BIODIVERSITY CONSERVATION

Course coordinator: Assoc. Prof. Angela Bănăduc Ph.D. Head of Ecology and Environment Protection Department
Year, semester: III, VI
No. hours course: 28, laboratory: 14, seminar: 14
Discipline type: Compulsory, Complementary, ECTS: 4
Prerequisites: General ecology, Ecosystems: structure and functions, Vegetal biology (I), Vegetal biology (II), Animal Biology (I), Animal Biology (II).

Aims: Underling the knowledges related with the biodiversity conservation: the biodiversity concept, the causes of the biodiversity perdition, the necessity of biodiversity conservation, biodiversity conservation strategies. The cognition by the students of the biodiversity assessment methods, of the operational units identification for its conservation, of the related legislation and of the administrative structures with responsabilities in the field of biodiversity conservation.


Skills: The capacity to understand and reproduce the concepts, terms and principles specific for biodiversity conservation. The strategies, measures and methods knowledge and understanding. The capacity to communicate using the specific terms and concepts, to explain and interpret the causes of the biodiversity perdition, the necessity of its conservation and the strategies of biodiversity conservation. The capacity of systemic approaching and interpretation of the biodiversity conservation problems in the context of the sustainable development. The capacity to identify the operational units for the biodiversity conservation and to apply methods for biodiversity assessment.

Assessment: The final mark will be calculated based on:
activity during seminars - 10% of the final mark
practical examination - 20% of the final mark
essay preparation - 10% of the final mark
mid semester examination - 10% of the final mark
final examination - 50% of the final mark

References:
BIOPRODUCTIVITY

Course coordinator: Assoc. prof. eng. Mircea Octavian MICU Ph.D.
Year, semester: II/2
No. hours course: no. hours seminar: 1:1 (14/14)
Discipline type: A
Prerequisites: Plant Physiology, Botany, Meteorology, Ecopedology, Entomology, Phytopathology


Content:

Skills
Ability to analyze the internal and external factors determining productivity; identification of the restrictive factors and actions for their harmonization in order to increase the vegetal biomass production.

Assessment:
The final mark will be calculated based on :
Activity during seminars (%): 30
Final, written examination (%) : 70

References
Micu Mircea Octavian, - 2004, Productivitate, Editura Alma Mater, Sibiu;
IMMUNOLOGY

Course coordinator Lecturer Daniel Gheoca Ph.D.
Year, semester: III/VI
No. hours course: no. hours seminary: 14/28
Discipline type: Speciality,
ECTS: 6
Prerequisites: Animal cytology and histology, Animal physiology

Aims
Acquiring knowledge regarding the antigens and antibodies, the origin of immune system and its functioning mode. Understanding of the terms tolerance, immunity, immunodeficiency

Content

Skills
Ability of understanding and reproducing the terms, concepts and principles of immunology. Acquiring knowledge regarding antigens, antibodies and mechanisms of their interactions; immunity, autoimmunity, immunodeficiency.

Assessment:
essay preparation (20%)
mid semester examination (15%)
final examination (65%)

References:
Olinescu, Andrei, Imunologie, Ed. Didactica si pedagogica, Bucuresti, 1995
Vior, C., Raducanescu, H., Manolescu, N., Popoviciu A., 1980, Imunitatea si imunoprofilaxia la animale Ed, Ceres, Bucuresti
ORNITOLOGY

Course coordinator: Prof. CIOCHIA VICTOR Ph.D.
Year, semester: III/VI
No. hours course: no. hours seminary / laboratory: 14/14
Discipline type: Speciality,
ECTS: 6
Prerequisites: Verterbrate zoology (I), Verterbrate zoology (II) , Comparative Anatomy

Aims:
Acquiring knowledge on birds' taxonomy, origins and evolution, as well as their importance in different ecosystems. Highlighting the aspects regarding eco-physiology, ethology and population dynamics. Getting familiarized with the main study methods in ornithology. Acquiring abilities of visual and sound identification of birds.

Content

Skills
Ability of understanding and reproducing specific terms, principles of bird taxonomy, and main aspects related to birds' eco-ethology. Capacity of identification of different species from Romania, of exploring birds in order to forecast local diversity based on own observations and experiments using methods and techniques specific to this field.

Assessment:
The final mark will be calculated based on mid semester evaluations (15%), evaluation of independent activity consisting of essay preparation (20%), final written theoretical examination (65%).

References
Ciochia V., Ornitologie, ..........................