Sylabus

Wydział:

Wydział Biologii i Biotechnologii

Kierunek:

Biologia

Specjalność:

Medical Biology

Poziom studiów:

Studia pierwszego stopnia

Forma studiów:

Stacjonarne

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

11113-112-A ANALIZA MATEMATYCZNA

ECTS:3 CALCULUS

COURSE CONTENT

LECTURES

Function of one variable. Graphs. Limits and continuity. Derivatives. Local linearity and the differential. Taylor theorem. Local extrema. Optimization. Integrating functions of one variable. Area and volume.

CLASSES

Solving problems related with the lecture.

EDUCATIONAL OBJECTIVE

Students should become acquainted with calculus: with theory of functions of several variables, differentiating and integrating them. They should be able to apply their knowledge in life.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W02+++, P1A_W03+++, P1A_U01+++, P1A_K01++, P1A_K05+, P1A_K07+, P1A_K08++

Codes of learning outcomes in a major area of study K1_W01+++, K1_U01+++, K1_K02+, K1_K04+, K1_K08++

LEARNING OUTCOMES

Knowledge

W1 - knows basic concepts and theorems of the theory of functions, knows how to determine the domain and draw graphs, knows the concept of limit and continuity of functions of one variable; (K1_W01)

W2 - knows the theory of differentiating functions of one variable, understands the concept of optymalization (K1_W01)

W3 - knows and understand the theory related with integrating functions of one variable, (K1_W01)

Skills

U1 - determines and draws domain of the functions of one variable; draws the grephs; can find limit of the function; can check if the function is a continuous one; (K1_U01)

U2 - can find the derivative of one-variable functions, can find a tangent plane to the given curve; computes the approximation of the given expressions;can find Tylor polynomials; can find local and global extrema; (K1_U01)

U3 - can integrate functions of one variable; can find the area and the volume of the given region; (K1_U01)

Social competence

K1 - knows the limitation of his knowledge and understand why he should educate himself; (K1_K02, K1_K04)

K2 - asks questions in order to understand better the subject and to find missing elements in reasoning; (K1_K08)

K3 - can find the informations in the literature; (K1_K08)

BASIC LITERATURE

1) Mc Callum, Hughes-Hallett Gleason, 2009r., ""Calculus: Single Variable, 5th Edition "", wyd. Wiley, 2) Banaś J., Wędrychowicz S., 2006r., ""Zbiór zadań z analizy matematycznej."", wyd. wyd. WNT, s.s.488, 3) Leja F., 2008r., ""Rachunek różniczkowy i całkowy ze wstępem do równań różniczkowych"", 4) Musielakowie H. i J., 2002r., ""Analiza matematyczna"", wyd. wyd. Wydawnictwo Naukowe UAM, t.Tom1.

SUPPLEMENTARY LITERATURE

1) Gewert M., Skoczylas Z., 2009r., ""Analiza matematyczna 1. Definicje, twierdzenia, wzory"", wyd. Oficyna Wydawnicza Gi, 2) Gewert M., Skoczylas Z., 2009r., ""Analiza matematyczna 1. Przykłady i zadania", wyd. Oficyna Wydawnicza Gi, 3) Lassak M., 2010r., ""Matematyka dla studiów technicznych"", wyd. Wydawnictwo WM Supremum, s.224.

Course/module:
CALCULUS
Fields of education: exact sciences, medical sciences, health sciences and physical culture studies
Course status: Compulsory
Course group: A-basic course
ECTS code: 11113-112-A
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: II/4

Type of course:recitation classes, lecture
Number of hours per semester/week:
Lectures: 20/1
Classes: 25/1
Teaching forms and methods
Lectures
Lecture - Information and solving problems. (W1, W2, W3, U1, U2, U3, K1, K2, K3)
Classes
Recitation classes - solving math questions,discussion; (U1, U2, U3, K1, K2, K3)
Written examination (multiple matching test, multiple-choice test, structured questions) - Students will obtain test with test questions, open questions and tasks to do it by themselves, after two hours they will have to finish work and give back test to the teacher. (W1, W2, W3, U1, U2, U3, K1, K2, K3)
Written test 2 - Student receives on sheet of paper the math questions do it by himselve. (U3, K1, K3)
Written test 1 - Student receives on sheet of paper the math questions do it by himselve. (U1, U2, K1)
Form and conditions of obtaining credit:
Examination
Number of ECTS points: 3
Language of instruction: English
Introductory courses: elementary mathematisc
Preliminary requirements: elementary mathematisc

Name of the organizational unit offering the course:
Katedra Analizy i Równań Różniczkowych
Address: ul. Słoneczna 54, 10-710 Olsztyn
tel. 524 60 46/fax. 524 60 07
Person in charge of the course:
dr Joanna Kluczenko
e-mail: jgawrycka@matman.uwm.edu.pl
Course coordinators:
dr Joanna Kluczenko

Detailed description of the awarded ECTS points - part B

ANALIZA MATEMATYCZNA

ECTS: 3 **CALCULUS**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- Participation in lectures	20,0 h
- Participation in classes	25,0 h
TOTAL:	45,0 h

2. Student's independent work:

TOTAL:	0,0 h
contact hours + student's independent work COMBINED TOTAL:	45,0h

Practical classes:

- practical classes	45,0 h
	45,0 h

1 ECTS point = 15,00h of the average student's work,

number of ECTS points = 45,00 h: 15,00 h/ECTS = **3,00 ECTS**

on average **3 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **3,00** ECTS points (3,00 z 3),
- including the number of ECTS points for hours completed in the form of the student's independent work - **0,00** ECTS points (0,00 z 3).

Number of ECTS for hours in practical classes - **0,00**

Number of ECTS for hours in practical classes - **2,25**

Number of ECTS for hours in professional practice - **1,13**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-C ANG. ZOOLOGIA

ECTS:4 ZOOLOGY

COURSE CONTENT

LECTURES

Functional morphology of animals of different body structure: single-celled and multicellular Metazoa Protozoa, Diblastica and Triblastica, Protostomia and Deuterostomia. Embryonic development as a property of metazoan life. Primary and secondary body cavity - the characteristics and features, benefits and limitations. Characteristic features of systematic major groups of animals. Integument of invertebrates and vertebrates, structure and functions. External and internal skeleton animals, the muscular system - examples and features. The nervous system and sensory organs selected invertebrates and vertebrates. Overview of structures for internal transport and structures for gas exchange in the air and in the water. Eating habits of animal based on selected examples, the construction of the digestive system of animals. Osmoregulation and excretion in invertebrates and vertebrates. Asexual reproduction, sexual and unisexual animals.

CLASSES

Functional morphology of Protozoa - Ciliata ciliates and Metazoa - multicellular animals; Porifera, Eumetazoa: Diblastica and Triblastica: Acoelomata - flatworms, Pseudocoelomata - nematodes and Coelomata; Annelida annelids, arthropods. Comparison of primary and secondary body cavity. The functional morphology of arthropod; crustaceans, Uniramia - insects and Myriapoda, Mollusca. Chordata: Cephalochordata, jawless vertebrates - primitive - river lamprey. Comparison of clusters of rayfinned fish Actinopterygii and Chondrichthyes cartilaginous fish. Functional morphology of Amphibia amphibians and reptiles Reptilia and endotermic verebrates - Aves, Mammalia.

EDUCATIONAL OBJECTIVE

Introduce students with the construction and functioning of animal organisms, developing skills for comparative analysis of functional morphology of selected taxa of invertebrates and vertebrates. Understanding the features of systematic and phylogenetic relationships of the major groups of animals Animalia.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W04++, P1A_W05++, P1A_U01+, P1A_U02+, P1A_U03+, P1A_U06+, P1A_U07+, P1A_K04+, P1A_K05+, P1A_K07+

Codes of learning outcomes in a major area of study K1_W15+, K1_W16+, K1_U03+, K1_U12+, K1_K05+, K1_K07+

LEARNING OUTCOMES

Knowledge

W1 - lists and characterizes the individual taxa of invertebrates and vertebrate (K1_W15)

W2 - names and explains the characteristics of the construction and functioning of animal organisms (K1_W16)

Skills

U1 - characterize the functional morphology of the basic groups of animals - their functioning and structure of systems and organs (K1_U03)

U2 - indicates the specific characteristics of the major taxonomic groups of animals (K1_U12)

Social competence

K1 - behaves in accordance with accepted principles of ethics to the wild and laboratory animals (K1_K07)

K2 - is aware of the dynamic development in biological research (K1_K05)

BASIC LITERATURE

1) Karel F. Liem, Warren Franklin Walker , 2001r., "Functional anatomy of the vertebrates: an evolutionary perspective", wyd. Harcourt College Publishers, t.1, s.703, 2) Richard C. Brusca, Gary J. Brusca, N. J. Haver , 203r., "Invertebrates 2nd edition", wyd. Sinauer Associates; 2 edition , t.1, s.936.

SUPPLEMENTARY LITERATURE

1) Brylińska M., 2000r., "Ryby słodkowodne Polski", wyd. Naukowe PWN, Warszawa.

Course/module:
ZOOLOGY
Fields of education: natural sciences
Course status: Compulsory
Course group: C-specialty course
ECTS code: 13113-112-C
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/1

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 20/2
Classes: 35/3
Teaching forms and methods
Lectures
Lecture - lecture and multimedia presentation (W1, W2, U1, U2, K1, K2)
Classes
Laboratory classes - Exercises in the diagnosis of selected taxa of invertebrates and vertebrate (U1, U2, K1, K2)
Written examination (yes/no questions test, structured questions) - written exam test and / or requiring short written answers (W1, W2)
Written test 1 - two written tests of the contents training (U1, U2, K1, K2)
Written test 2 - second written test (U1, U2, K1, K2)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 4
Language of instruction: English
Introductory courses: lack
Preliminary requirements: lack

Name of the organizational unit offering the course:
Katedra Zoologii
Address: ul. Michała Oczapowskiego 5, pok. 261, 10-718 Olsztyn
tel./fax 523-32-61
Person in charge of the course:
prof. dr hab. Alicja Lidia Boroń, prof.zw.
e-mail: alibo@uwm.edu.pl
Course coordinators:
prof. dr hab. Alicja Lidia Boroń, prof.zw., dr Iwona Jeleń, dr Dorota Juchno, dr inż. Jolanta Barbara Szlachciak

Detailed description of the awarded ECTS points - part B

ANG. ZOOLOGIA

ECTS: 4 ZOOLOGY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:		
- Participation in lectures		20,0 h
- Participation in classes		35,0 h
	TOTAL:	55,0 h
2. Student's independent work:		
- the development of the reports of the exercises		10,0 h
- prepare for the exam		20,0 h
- preparation for colloquia		20,0 h
	TOTAL:	50,0 h
	contact hours + student's independent work COMBINED TOTAL:	105,0h
Practical classes:		
- practical classes		h
		h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 105,00 h: 25,00 h/ECTS = **4,20 ECTS**

on average **4 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,10** ECTS points (2,20 z 4,2),
- including the number of ECTS points for hours completed in the form of the student's independent work - **1,90** ECTS points (2,00 z 4,2).

Number of ECTS for hours in practical classes - **1,80**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-CF BASIS OF EPIDEMIOLOGY

ECTS:2 BASIS OF EPIDEMIOLOGY

COURSE CONTENT

LECTURES

Definition of epidemiology; historical evolution of epidemiology, natural history and spectrum of disease. Chain of infection and epidemic disease occurrence. Morbidity and mortality frequency measures. Purpose and characteristics of public health surveillance.

CLASSES

Students who successfully complete this course should be able to correctly: describe key features and applications of descriptive and analytic epidemiology, Calculate and interpret ratios, proportions, incidence rates, mortality rates, prevalence, and years of potential life lost. Describe the processes, uses, and evaluation of public health surveillance. Describe the steps of an outbreak investigation.

EDUCATIONAL OBJECTIVE

This course covers basic epidemiology principles, concepts, and procedures useful in the surveillance and investigation of health-related states or events.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01++, P1A_W02+, P1A_W03++, P1A_W06+, P1A_U01++, P1A_U05++, P1A_U06+, P1A_K01+, P1A_K05+

Codes of learning outcomes in a major area of study K1_W02+, K1_W03++, K1_U01+, K1_U02++, K1_K04+

LEARNING OUTCOMES

Knowledge

W1 - knows some basic epidemiological problems (K1_W02, K1_W03)

W2 - understands the importance of epidemiological studies (K1_W03)

Skills

U1 - understands and knows how to analyze epidemiological indicators (K1_U01)

U2 - knows some basic biostatistical methods (K1_U02)

U3 - Describe the processes, uses, and evaluation of public health surveillance (K1_U02)

Social competence

K1 - understands the importance of raising professional competence (K1_K04)

BASIC LITERATURE

1) Bonita R. et all., 2010r., "Basic epidemiology", wyd. WHO, 2) Carr S. et all., 2010r., "An Introduction to Public Health and Epidemiology", wyd. Open University Press, 3) Bauman R., 2012r., "Microbiology with diseases by body system", wyd. Pearson.

SUPPLEMENTARY LITERATURE

1) Dąbrowska-Szponar M., Garbacz K., Piechowicz L., 2011r., "Praktyczny atlas mikrobiologii", wyd. Gdański Uniwersytet Medyczny.

Course/module:
BASIS OF EPIDEMIOLOGY
Fields of education: natural sciences
Course status: Compulsory
Course group: CF-
ECTS code: 13113-112-CF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: L/100

Type of course:practical classes, lecture
Number of hours per semester/week:
Lectures: 10/2
Classes: 15/3
Teaching forms and methods
Lectures
Lecture - Multimedia presentation (W1, W2, U3)
Classes
Practical classes - computer classes (W2, U1, U2, K1)
Practical test 2 - practic exam, statistical analysis of data (W1, U1, U2, U3, K1)
Report 1 - report of the analysis (W2, U1, U2, K1)
Form and conditions of obtaining credit:
Graded credit
Number of ECTS points: 2
Language of instruction: English
Introductory courses: without indicating
Preliminary requirements: without indicating

Name of the organizational unit offering the course:
Katedra Mikrobiologii
Address: M.Oczapowskiego 1A, 208, 10-719 Olsztyn
523-45-67
Person in charge of the course:
prof. dr hab. Aleksander Wacław Świątecki
e-mail: aswiat@uwm.edu.pl
Course coordinators:
prof. dr hab. Aleksander Wacław Świątecki

Detailed description of the awarded ECTS points - part B

BASIS OF EPIDEMIOLOGY

ECTS: 2 BASIS OF EPIDEMIOLOGY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultations	2,0 h
- Participation in lectures	10,0 h
- Participation in classes	15,0 h
TOTAL:	27,0 h

2. Student's independent work:

- preparation of reports	6,0 h
- preparing to exams	6,0 h
- preparing to labs	5,0 h
TOTAL:	17,0 h
contact hours + student's independent work COMBINED TOTAL:	44,0h

Practical classes:

- practical classes	15,0 h
	15,0 h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 44,00 h: 25,00 h/ECTS = **1,76 ECTS**

on average **2 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **1,23** ECTS points (1,08 z 1,76),
- including the number of ECTS points for hours completed in the form of the student's independent work - **0,77** ECTS points (0,68 z 1,76).

Number of ECTS for hours in practical classes - **1,00**

Number of ECTS for hours in practical classes - **0,75**

Number of ECTS for hours in professional practice - **0,38**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13613-112-C BIOCHEMIA

ECTS:7 BIOCHEMISTRY

COURSE CONTENT

LECTURES

Structure and properties of amino acids, peptides and proteins. Metabolism of proteins and amino acids. Structure, function and metabolism of free nucleotides. DNA structure, replication and repair. RNA structure, synthesis and processing. Protein synthesis and post-translational modifications. Regulation of gene expression. Specific features of the human genome. Enzymes – structure, classification, regulating of enzymatic activity, enzymes in medical practice. Coenzymes and isoenzymes.Carbohydrates - structure, properties and metabolism of monosaccharides, disaccharides and polysaccharides. Lipids - structure, properties and metabolism. Interdependence of nitrogen metabolism, lipid and carbohydrate metabolism and their regulation. Hormones, vitamins and microelements. Metabolic profile of organs. Bioenergetics and oxidative phosphorylation.

CLASSES

Properties of amino acids and proteins.Quantitative protein identification. Electrophoresis of blood serum proteins.Isolation and dependence of enzyme activity on pH and temperature.Identifying the activity of AST and ALT. Quantitative identification of glucose in the blood serum by the kit and HPLC.Identifying total cholesterol and HDL fraction in the blood serum.TLC of brain polar lipids.Quantitative identification of creatinine and uric acid in blood serum. Isolation of genomic DNA and quantitative and qualitative assessment of isolated DNA. Amplification of DNA by PCR method and visualization of amplification products on an agarose gel.

EDUCATIONAL OBJECTIVE

Explanation of structure and function of the major components of the living organisms. Understanding the main metabolic pathways. Identifying controls and maintain the dynamic equilibrium of the body. Application of selected biochemical indices in medical practice.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01++, P1A_W03+, P1A_W04+++, P1A_W05+++, P1A_W07++, P1A_W08++, P1A_U01+++, P1A_U02++, P1A_U04+, P1A_U05+, P1A_U06+++, P1A_U07+, P1A_U09+, P1A_U12+, P1A_K02+, P1A_K03+, P1A_K05++, P1A_K07+

Codes of learning outcomes in a major area of study K1_W05+, K1_W06+, K1_W07+, K1_W08+, K1_W09+, K1_W11+, K1_W32+, K1_U03+, K1_U04+, K1_U06+, K1_U07+, K1_U08+, K1_U09+, K1_U11+, K1_U17+, K1_K01+, K1_K03+, K1_K05+

LEARNING OUTCOMES

Knowledge

W1 - The student has knowledge of chemistry, describes the structure and can associate it with the function of biomolecules (K1_W05, K1_W06)

W2 - Defines and describes the metabolism in various biological systems at the cellular and organism. The student knows the mechanisms of metabolic regulation (K1_W07, K1_W08)

W3 - The ability to define and characterize the biochemical processes at the cellular and molecular level in relation to the human body (K1_W09, K1_W11)

W4 - The student knows the basic biochemical techniques (K1_W32)

Skills

U1 - The student is able to use basic biochemical techniques (K1_U04)

U2 - The student can perform qualitative and quantitative analysis (K1_U06)

U3 - The student has the ability to use basic research equipment (K1_U08)

U4 - Able to perform simple analysis using biological material (K1_U03, K1_U07)

U5 - Performs basic research tasks under the guidance of a tutor (K1_U09)

U6 - Demonstrates the ability to critically data analysis (K1_U11)

U7 - Has the ability to use the English language for literature in biochemistry (K1_U17)

Social competence

K1 - Demonstrates a willingness to use scientific language in discussions with experts from related fields (K1_K01)

K2 - Able to work in a team, taking a variety of roles and define priorities (K1_K03)

K3 - Is aware of the constant updating of knowledge in biochemistry (K1_K05)

BASIC LITERATURE

1) Murray R., Bender D., et all., ""Harper's Illustrated Biochemistry"", t.28th edition, 2) Harvey R., Ferrier D., ""Lippincott's Illustrated reviews: Biochemistry"", t.5th edition, 3) Mathews Ch.K., Van Holde K.E. et all., ""Biochemistry"", t.4th edition.

SUPPLEMENTARY LITERATURE

1) Liberman M., Marks A., ""Mark's Basic Medical Biochemistry, a Clinical Approach"", t.3rd edition.

Course/module:
BIOCHEMISTRY
Fields of education: natural sciences
Course status: Compulsory
Course group: C-specialty course
ECTS code: 13613-112-C
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: II/3

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 30/2
Classes: 45/4
Teaching forms and methods
Lectures
Lecture - Informative lecture using multimedia resources (W1, W2, W3, U7, K1, K3)
Classes
Laboratory classes - 11 practical labs and one hour to pass final (W1, W4, U1, U2, U3, U4, U5, U6, U7, K1, K2)
Written examination (multiple matching test) - Test fitting answer, multiple choice, 100 questions (W1, W2, W3, W4, U7, K1, K3)
Written test 1 - Entrance test before every lab, multiple choice, open questions (W1, W4, U6, U7, K1)
Teamwork assessment 1 - Observation of the student by the teacher (K2)
Report 1 - A written report after each lab, including the principle of the method, calculations, results and conclusions (W4, U1, U2, U3, U4, U5, U6, U7, K1, K2)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 7
Language of instruction: English
Introductory courses: Organic chemistry
Preliminary requirements: The student should have a base of organic and inorganic chemistry.

Name of the organizational unit offering the course:
Katedra Biochemii
Address: ul. Michała Oczapowskiego 1A, pok. 316, 10-719 Olsztyn
tel. 523-39-90, 523-48-83, tel./fax 535-20-15
Person in charge of the course:
dr Małgorzata Dmitryjuk
e-mail: m.dmit@uwm.edu.pl
Course coordinators:
dr Małgorzata Dmitryjuk, dr Elżbieta Łopieńska-Biernat

group size 12-15 people

Detailed description of the awarded ECTS points - part B

BIOCHEMIA

ECTS: 7 **BIOCHEMISTRY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultation	2,0 h
- Participation in lectures	30,0 h
- Participation in classes	45,0 h
TOTAL:	77,0 h

2. Student's independent work:

- writing reports	11,0 h
- preparation for the exam	40,0 h
- preparation for entrance tests	30,0 h
- preparation for labs	11,0 h
TOTAL:	92,0 h
contact hours + student's independent work COMBINED TOTAL:	169,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 169,00 h: 25,00 h/ECTS = **6,76 ECTS**

on average **7 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **3,19** ECTS points (3,08 z 6,76),
- including the number of ECTS points for hours completed in the form of the student's independent work - **3,81** ECTS points (3,68 z 6,76).

Number of ECTS for hours in practical classes - **0,00**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-A BIOFIZYKA

ECTS:5 BIOPHYSICS

COURSE CONTENT

LECTURES

Skeleton, forces, and body stability. Energy balance in the body, energy consumption, heat losses, law of thermodynamics. Breathing, physics of the cardiovascular system. Nature and characteristics of sound, production of speech, physics of the ear, diagnostics with sound and ultrasound. Physics of the eye. Electromagnetism. Electric and magnetic field. Electric potential, current, resistance and capacitance. Simple electric circuits. Electromagnetic waves. Physics of the nervous system. Electrical signals and information transfer. Radiation and radiation protection. Diagnostic radiology. Diagnostic and therapeutic nuclear medicine. Physical methods in biology: absorption spectroscopy, FTIR, fluorescence. Diffusion, osmosis, sedimentation, electrophoresis.

CLASSES

Determination of transport number and mobility of ions in electrolytic conductors. Ionizing radiation. Determination of linear and mass absorption coefficient of gamma rays for different materials. Electrical activity of the heart. Electrocardiography. Determination of the heart's electrical vector. Laminar and turbulent flow. Measurement of fluid viscosity. The sense of hearing. Measures of auditory threshold. Physical principles of ultrasound in medicine. Ultrasonography. Determination of blood pressure. Modeling the electrical properties of biological objects. Examination of serial RLC circuit. The phenomenon of absorption and emission of light in analysis. Measurement of absorption spectra and the concentration of riboflavin in aqueous solutions using a spectrophotometer. Determination of concentrations of substances in solution using fluorescence.Optical rotation of solutions. Measurement of the concentration of optically active substances by using a polarimeter. Determination of changes of thermodynamic function of state. Determination of changes in the entropy of the system. Determination of enthalpy change in the process of dissolving salt.

EDUCATIONAL OBJECTIVE

Understanding physical processes, natural phenomena and their relationship with the functioning of living organisms; understanding the specificity of experiments in life sciences;student will be able perform simple observations and simple physical measurements; will be able to use simple research equipment;will be able to use professional language in discussion with specialists from related scientific areas;

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01+, P1A_W03+, P1A_U01+, P1A_U06+, P1A_U11+, P1A_K02+, P1A_K03+

Codes of learning outcomes in a major area of study K1_W03+, K1_U03+, K1_U16+, K1_K03+

LEARNING OUTCOMES

Knowledge

W1 - understands physical processes, natural phenomen and their relationship with the functioning of living organis (K1_W03)

Skills

U1 - can perform simple observations and simple physical, biological and chemical measurements (K1_U03)

U2 - learns individually in directed way (K1_U16)

Social competence

K1 - is capable of performing different roles and choosing priorities in a team effort (K1_K03)

BASIC LITERATURE

1) Davidovits P, 2007r., "Physics in Biology and Medicine", wyd. Academic Press, 2) Hobbie R, Roth B, 2007r., "Intermediate Physics for Medicine and Biology", wyd. Springer, 3) Glaser R, 2004r., "Biophysics", wyd. Springer.

SUPPLEMENTARY LITERATURE

1) Holliday D, 2011r., "Principles of Physics", wyd. John Wiley & Sons.

Course/module:
BIOPHYSICS
Fields of education: natural sciences
Course status: Compulsory
Course group: A-basic course
ECTS code: 13113-112-A
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/2

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 20/2
Classes: 50/3
Teaching forms and methods
Lectures
Lecture - Lecture with mulimedial presentation (W1, U2)
Classes
Laboratory classes - performance of exercice - phenomena studying, physical values measuring, analysis of results (W1, U1, U2, K1)
Written examination (structured questions) - after written examination, suplementary oral exam possible (W1, U2)
Practical test 1 - passing laboratory on the basis of partial oral or written evaluation and practical report preparet by student for each exercice (W1, U1, U2, K1)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 5
Language of instruction: Polish
Introductory courses: mathematics, physics
Preliminary requirements: general knowledge of basic mathematics and elementary physics

Name of the organizational unit offering the course:
Katedra Fizyki i Biofizyki
Address: ul. Michała Oczapowskiego 4, pok. 107, 10-719 Olsztyn
tel. 523-38-61, 523-34-06, fax 523-38-61
Person in charge of the course:
dr hab. Krzysztof Marian Bryl
Course coordinators:
dr hab. Krzysztof Marian Bryl, dr Monika Anna Pietrzak

Detailed description of the awarded ECTS points - part B

BIOFIZYKA

ECTS: 5 **BIOPHYSICS**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultation		2,0 h
- Participation in lectures		20,0 h
- Participation in classes		50,0 h
	TOTAL:	72,0 h

2. Student's independent work:

- selfpreparig to laboratory		50,0 h
	TOTAL:	50,0 h
	contact hours + student's independent work COMBINED TOTAL:	122,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 122,00 h: 25,00 h/ECTS = **4,88 ECTS**

on average **5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,95** ECTS points (2,88 z 4,88),
- including the number of ECTS points for hours completed in the form of the student's independent work - **2,05** ECTS points (2,00 z 4,88).

Number of ECTS for hours in practical classes - **1,20**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-CF BIOLOGIA KOMÓRKI

ECTS:2 CELL BIOLOGY

COURSE CONTENT

LECTURES

Introduction to cell biology: cell theory, comparison of eucaryotic and procaryotic cells. Cell structure and function: the nucleus; protein sorting and transport (endoplasmic reticulum, Golgi apparatus, lysosomes), bioenergetics and metabolism (mitochondria, chloroplasts and peroxisomes); the plasma membrane and extracellular matrix. Cell regulation: cell cycle control, cell death and renewal.

CLASSES

Introduction to microscopic techniques. Experimentation, observations and analysis of cell structure and particular organelles: the cell membrane, the extracellular matrix and cell interactions, the cytoskeleton and cell movement, the cell cycle with the events of M phase, protein sorting, transport and degradation (the endoplasmic reticulum, the Golgi apparatus, the lysosomes), bioenergetics of the cell (mitochondra, chloroplasts, peroxisomes). Ultrastructure of organelles - electronograms.

EDUCATIONAL OBJECTIVE

Characteristic of cell structure and function. Subcellular localization of processes. Ultrastructure of plant and animal cell organelles. Methods of analysis of Eucaryotic organelles structure and function.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01+, P1A_W02+, P1A_W04+++, P1A_W05+++, P1A_W07+, P1A_U01+++, P1A_U06+++, P1A_U11+, P1A_K02+, P1A_K03+, P1A_K05+, P1A_K07+

Codes of learning outcomes in a major area of study K1_W06+, K1_W13++, K1_W28+, K1_U03++, K1_U07+, K1_U08+, K1_U16+, K1_K03+, K1_K05+

LEARNING OUTCOMES

Knowledge

W1 - can describe ultrastructure and function of eucaryotic and procaryotic cell organelles (K1_W06, K1_W13)

W2 - describes cell theory and the properties of cells as the basic units of structure in all organisms and also the basic units of reproduction (K1_W13)

W3 - knows structural and optical components of light microscopy and their function (K1_W28)

Skills

U1 - can prepare a biological samples for microscopic studies (K1_U03, K1_U07)

U2 - uses simple microscopic techniques (K1_U03, K1_U08)

U3 - learns individually under guidance, is capable of transferring the acquired knowledge and skills (K1_U16)

Social competence

K1 - is capable of performing different roles and choosing priorities in a team effort (K1_K03)

K2 - recognizes the need for updating knowledge of biology (K1_K05)

BASIC LITERATURE

1) Cooper G.M., Hausman R.E., 2009r., "The Cell. 5th edition", wyd. Palgrave Macmillan, 2) Bolsover S.R., Shephar E.A., Hyams J.S.,, 2011r., "Cell Biology: A Short Course, 3rd Edition", wyd. Wiley-Blackwell, 3) Karp G.,, 2000r., "Cell and molecular biology. Concepts and experiments", wyd. John Wiley & Sons, Inc, 4) Chandar N., Viselli S., 2010r., "Lippincott's Illustrated Reviews: Cell and Molecular Biology (International Edition)", wyd. Lippincott Williams & Wilkins, 5) Lodish H. i inni, 2007r., "Student Solutions Manual for Molecular Cell Biology. 6th Edition", wyd. Palgrave Macmillan..

SUPPLEMENTARY LITERATURE

Brak

Course/module:
CELL BIOLOGY
Fields of education: natural sciences, medical sciences, health sciences and physical culture studies
Course status: Compulsory
Course group: CF-
ECTS code: 13113-112-CF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/1

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 10/2
Classes: 20/3
Teaching forms and methods
Lectures
Lecture - discourse given by an instructor before a group where cell biology issues are analyzed and discussed (W1, W2, U3, K2)
Classes
Laboratory classes - experimentation, observation and analysis of biological samples under light microscope (W1, W2, W3, U1, U2, U3, K1, K2)
Written examination (structured questions) - written exam with 4-5 questions regarding issues discussed during lectures (W1, W2, U3, K2)
Written test 1 - 2 tests during classes (W1, W2, W3, U3, K2)
Practical test 2 - At the last classes students have to prepare and analyze microscopic specimens. They have to also describe a few images taken under the microscope and electronograms discussed during classs. (W1, W3, U1, U2, K1)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 2
Language of instruction: English
Introductory courses: -
Preliminary requirements: -

Name of the organizational unit offering the course:
Katedra Fizjologii, Genetyki i Biotechnologii Roślin
Address: ul. Michała Oczapowskiego 1A, 10-719 Olsztyn
tel. 523-48-24, fax 523-48-81
Person in charge of the course:
dr Katarzyna Głowacka
e-mail: katarzyna.glowacka@uwm.edu.pl
Course coordinators:
dr Katarzyna Głowacka, dr Wioletta Ewa Pluskota

15-20 students in the group

Detailed description of the awarded ECTS points - part B

BIOLOGIA KOMÓRKI

ECTS: 2 CELL BIOLOGY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultation with the teacher	2,0 h
- Participation in lectures	10,0 h
- Participation in classes	20,0 h
TOTAL:	32,0 h

2. Student's independent work:

- preparation for exam	8,0 h
- preparation for practical test	3,0 h
- preparation for tests	7,0 h
TOTAL:	18,0 h
contact hours + student's independent work COMBINED TOTAL:	50,0h

Practical classes:

- practical classes	20,0 h
	20,0 h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 50,00 h: 25,00 h/ECTS = **2,00 ECTS**

on average **2 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **1,28** ECTS points (1,28 z 2),
- including the number of ECTS points for hours completed in the form of the student's independent work - **0,72** ECTS points (0,72 z 2).

Number of ECTS for hours in practical classes - **1,20**

Number of ECTS for hours in practical classes - **1,00**

Number of ECTS for hours in professional practice - **0,50**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-B BIOLOGICZNE METODY DIAGNOSTYCZNE

ECTS:7 BIOLOGICAL METHODS OF DIAGNOSTIC

COURSE CONTENT

LECTURES

Biological methods for the diagnosis of parasitological, mycological, bacteriological and toxicological

CLASSES

Advanced techniques and tools in clinical microbiology; Fluorescence microscopy; biochemical and molecular methods for identification of microorganisms; automation of microbiological tests; modern techniques of environmental analysis.

SEMINAR

Diagnostic methods in the diagnosis of diseases caused by parasites, fungi, bacteria, and diagnostics toxicology

EDUCATIONAL OBJECTIVE

The students get acquainted with modern techniques of microbiological tests; will acquire a skills for use of the test apparatus: molecular, biochemical, and environmental.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W02+, P1A_W04+++, P1A_W05+, P1A_W07+++, P1A_W08++, P1A_W09+, P1A_U01+++, P1A_U05+, P1A_K01+, P1A_K05+, P1A_K06+, M1_U01+, M1_U02+, M1_U03+, M1_U04+, M1_U05+, M1_U06+, M1_U07+, M1_U08+, M1_U09+, M1_U10+, M1_U11+, M1_U12+, M1_U13+, M1_U14+

Codes of learning outcomes in a major area of study K1_W26+, K1_W28+, K1_W29+, K1_W32+, K1_W34+, K1_U04+, K1_U05+, K1_U06+, Med_U+, K1_K04+, K1_K06+

LEARNING OUTCOMES

Knowledge

W1 - understand the causes and consequences of environmental degradation (K1_W26)
W2 - knows the basic equipment and supplies used in microbiological testing (K1_W28)
W3 - knows the basic principles of the methodology of experimental work (K1_W29)
W4 - familiar with the basic techniques of biochemical, genetic and microbiological (K1_W32)
W5 - has a basic knowledge of the basic techniques and tools used in microbiology (K1_W34)

Skills

U1 - knows how to use basic microbiological techniques (K1_U04)
U2 - able to apply the basic methods of molecular biology (K1_U05, Med_U)
U3 - has the ability to use a simple research equipment (K1_U06)

Social competence

K1 - understands the need to increase professional competence (K1_K04)
K2 - is responsible for working with a microbiological samples (K1_K06)

BASIC LITERATURE

1) Michael J. Leboffe, Burton E. Pierce , 2010r., "Microbiology: Laboratory Theory and Application", wyd. Morton Publishing Company, t.3th Edition, 2) Robert W. Bauman, 2011r., "Microbiology with Diseases by Body System", wyd. Benjamin Cummings, t.3rd Edition.

SUPPLEMENTARY LITERATURE

1) Gerard J. Tortora, 2009r., "Microbiology An Introduction", wyd. Benjamin-Cummings Publishing Company, t.10th Edition, 2) Paul G. Engelkirk, Janet L. Duben-Engelkirk, 2008r., "Laboratory Diagnosis of Infectious Diseases: Essentials of Diagnostic Microbiology", wyd. Lippincott Williams & Wilkins, 3) Carol A. Kauffman, Peter G. Pappas, Jack D. Sobel, William E. Dismukes, 2011r., "Essentials of Clinical Mycology", wyd. Springer, t.2th Edititon.

Course/module:
BIOLOGICAL METHODS OF DIAGNOSTIC
Fields of education: natural sciences
Course status: Compulsory
Course group: B-major course
ECTS code: 13113-112-B
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: III/5

Type of course:practical classes, lecture
Number of hours per semester/week:
Lectures: 20/2
Classes: 10/3
Seminar: 70/4
Teaching forms and methods
Lectures
Lecture - lectures with a multimedia presentation (W1, W3, W4, W5, U1, K1, K2)
Classes
Practical classes - laboratory classes (W1, W2, W3, W4, W5, U1, U2, U3, K1, K2)
Written examination (multiple-choice test) - The written examination in the form of multiple-choice test (W1, W2, W3, W4, W5, U1, U2, U3, K1, K2)
Practical test 2 - perform the tasks of the techniques and tools used in microbiological assays (W2, W5, U1, U2, U3, K2)
Report 1 - report of the results and their interpretation (W1, W3, W4, U1, U2, U3, K1)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 7
Language of instruction: English
Introductory courses: no indications
Preliminary requirements: no indications

Name of the organizational unit offering the course:
Katedra Mikrobiologii
Address: M.Oczapowskiego 1A, 208, 10-719 Olsztyn
523-45-67
Person in charge of the course:
prof. dr hab. Aleksander Wacław Świątecki
e-mail: aswiat@uwm.edu.pl
Course coordinators:
prof. dr hab. Aleksander Wacław Świątecki

groups of 8-10 students

Detailed description of the awarded ECTS points - part B

BIOLOGICZNE METODY DIAGNOSTYCZNE

ECTS: 7 BIOLOGICAL METHODS OF DIAGNOSTIC

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultations	1,0 h
- Participation in seminar	70,0 h
- Participation in lectures	20,0 h
- Participation in classes	10,0 h
TOTAL:	101,0 h

2. Student's independent work:

- preparing the reports	15,0 h
- Exam preparation	20,0 h
- preparation for colloquiums	15,0 h
- preparation of laboratory	20,0 h
TOTAL:	70,0 h
contact hours + student's independent work COMBINED TOTAL:	171,0h

Practical classes:

- practical classes	10,0 h
	10,0 h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 171,00 h: 25,00 h/ECTS = **6,84 ECTS**

on average **7 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **4,13** ECTS points (4,04 z 6,84),
- including the number of ECTS points for hours completed in the form of the student's independent work - **2,87** ECTS points (2,80 z 6,84).

Number of ECTS for hours in practical classes - **1,00**

Number of ECTS for hours in practical classes - **0,50**

Number of ECTS for hours in professional practice - **0,25**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-C BOTANIKA

ECTS:5 BOTANY

COURSE CONTENT

LECTURES

Introduction to the course (learning objectives, research methods, rules for counting exercises, the rules pass the course). Characteristics of plant tissues. Structure and function of vegetative and generative organs of plants. Plants adaptations to different environmental conditions. Plant propagation. Construction of seeds and fruits. Basics of botanical plant classification and nomenclature. Taxonomic review of medicinal plants - anatomical, morphological, ecological and chemical characteristic. The methods of making herbarium sheets.

CLASSES

Microscopic and macroscopic observations of morphology and anatomy of the plant organism. Life cycle of plants, organs and vegetative propagation. Analysis of the structure and function relationships of plant organs. Observations of the characteristics of selected families of medicinal plants and poisonous angiosperms, gymnosperms and Thallus plants examples of selected species (living specimens and herbarium materials). Microscopic and macroscopic observations of anatomical structure and morphology of selected medicinal plants. Learning to use the key to determining the medicinal plants. Recognition of plants in the field and botanical description. Preparation of herbarium sheets.

EDUCATIONAL OBJECTIVE

Understanding the morphology and anatomy of plants. Understanding the links between the construction of bodies, including their modification, with their function. Ability to use a light microscope, the preparation of simple slides. Acquisition of basic knowledge on medicinal plants - morphological and anatomical characteristics, occurrence in the environment, recognition in the area, the types of manufactured compounds of pharmaceutical interest. Learning the methods of preparing herbarium sheets.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W02++, P1A_W04+++, P1A_W05+++, P1A_W06+, P1A_W07++, P1A_W09++, P1A_U01+++, P1A_U02+, P1A_U03+++, P1A_U04++, P1A_U06+++, P1A_U07+++, P1A_U08++, P1A_U09+++, P1A_U10+++, P1A_K01+, P1A_K04+, P1A_K05++, P1A_K06+, P1A_K07++

Codes of learning outcomes in a major area of study K1_W07+, K1_W14+, K1_W15++, K1_W16+, K1_W19+, K1_W20++, K1_W28+, K1_W30+, K1_W33+, K1_W34++, K1_U03++, K1_U04++, K1_U07+++, K1_U08++, K1_U09++, K1_U12+, K1_U13+++, K1_U18++, K1_K01+, K1_K02+, K1_K05+, K1_K06+, K1_K07+

LEARNING OUTCOMES

Knowledge

W1 - Description the relationship between tissue structure of organs with their function. (K1_W14, K1_W15)

W2 - Knowledge of basic techniques and research tools used in the field of functional morphology of plants. (K1_W28, K1_W30, K1_W33)

W3 - Knowledge of the rules of working with biological material. (K1_W34)

W4 - Knowledge of the basics of plant classification and rules of botanical nomenclature. (K1_W19, K1_W20)

W5 - Knowledge of the characteristics of selected medicinal plants. (K1_W15, K1_W16, K1_W20)

W6 - Knowledge of the basic principles of the methodology of experimental and terrain work. (K1_W34)

W7 - Knowledge of specific plant substances with therapeutic effects. (K1_W07)

Skills

U1 - Ability to work with a microscope, analyze permanent and experiential slides. (K1_U03, K1_U08)

U2 - Ability to perform unstable slides using various techniques. (K1_U04, K1_U07)

U3 - The ability to link the morphology and anatomy of organs with their duties. (K1_U09, K1_U13)

U4 - The ability to recognize and characterize selected species of plants with therapeutic effects. (K1_U07)

U5 - The ability to macroscopically recognition the species, determination their membership to botanical families and characterization them. (K1_U03, K1_U07, K1_U09, K1_U13, K1_U18)

U6 - Able to work with a key to the determination of plants. (K1_U12)

U7 - Can name and describe the basic kind of plant substances with therapeutic effects. (K1_U04, K1_U13, K1_U18)

U8 - Can indicate where specific plant substances with therapeutic effects are collected in plant body . (K1_U08, K1_U13)

Social competence

K1 - Forming their own responsibility and respect for nature. (K1_K06)

K2 - Developing scientific and research activity. (K1_K01, K1_K02, K1_K05)

K3 - Act in accordance with ethical principles. (K1_K07)

BASIC LITERATURE

1) BRIAN CAPON, 2005r., "Botany for Gardeners", wyd. Timber Press, Inc., s.238, 2) Janice Glimn-Lacy, Peter B. Kaufman, 2006r., "Botany Illustrated", wyd. Springer, s.290, 3) Bryan G. Bowes, "A Colour Atlas of Palnt Structure", wyd. Manson Publishing, s.190, 4) WHO, 2009r., "WHO monographs on selected medicinal plants", wyd. WHO Library Cataloguing-in-Publication Data, t.4, s.456.

SUPPLEMENTARY LITERATURE

1) Jill Bailey (ed), 2003r., "The Facts On File DICTIONARY of BOTANY", wyd. Checkmark Books, s.256, 2) David Gledhill, 2008r., "THE NAMES OF PLANTS", wyd. Cambridge University Press, s.436, 3) J. Phil Gibson and Terri R. Gibson, 2007r., "Plant Diversity", wyd. Chelsea House An imprint of Infobase Publishing, s.145.

Course/module:
BOTANY
Fields of education: natural sciences, medical sciences, health sciences and physical culture studies
Course status: Compulsory
Course group: C-specialty course
ECTS code: 13113-112-C
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/2

Type of course:lecture, field courses, laboratory classes, recitation classes
Number of hours per semester/week:
Lectures: 20
Classes: 50
Teaching forms and methods
Lectures
Lecture - A talk with a multimedia presentation. (W1, W3, W4, W7, U3, U7, K1, K2, K3)
Classes
Recitation classes - Discussion, characteristics of botanical slides and exibitions. (W1, W2, W3, W4, W5, W6, W7, U3, U4, U8, K1, K2)
Laboratory classes - Working with slides, botanical exhibits andherbarial specimens. (W1, W2, W3, W4, W6, U1, U2, U3, U4, U5, U6, U7, U8, K2, K3)
Field courses - Familiarization with the selected plant species in their natural occurrence. (W3, W6, U5, U6, U8, K2, K3)
Written test 1 - As stated in the study plan and the plan of the course. (W1, W2, W5, W7, U1, U3, U4, U5, U7, U8, K2)
Practical test 2 - Recognizing plant with knowledge of morphological, anatomical, taxonomic affiliation and their healing properties. (W4, W5, W7, U5, U6, U7, U8, K3)
Test assignment 3 - Preparation of herbarium of medicinal plants. (W3, W4, W6, U6, K1, K3)
Report 4 - Drawings from the observation of macro-and microscopic with the description in the workbook. (W1, W2, W3, U1, U2, U4, K1, K3)
Form and conditions of obtaining credit:
Graded credit
Number of ECTS points: 5
Language of instruction: English
Introductory courses: non
Preliminary requirements: non

Name of the organizational unit offering the course:
Katedra Botaniki i Ochrony Przyrody
Address: pl. Łódzki 1, pok. 110, 10-727 Olsztyn
tel. 523-34-94, fax 523-35-46
Person in charge of the course:
dr hab. Hanna Teresa Ciecierska, prof. UWM

Course coordinators:
dr hab. Hanna Teresa Ciecierska, prof. UWM, dr inż. Anna Źróbek-Sokolnik

A group of 12-16 persons, due to the work of microscopes and fieldwork.

Detailed description of the awarded ECTS points - part B

BOTANIKA

ECTS: 5 **BOTANY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- Consultation		2,0 h
- Participation in lectures		20,0 h
- Participation in classes		50,0 h
	TOTAL:	72,0 h

2. Student's independent work:

- Preparation for tests		15,0 h
- Preparation for laboratory exercises		10,0 h
- Preparation for terrain exercises		10,0 h
- Preparation of herbarium cards		15,0 h
	TOTAL:	50,0 h
	contact hours + student's independent work COMBINED TOTAL:	122,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 122,00 h: 25,00 h/ECTS = **4,88 ECTS**

on average **5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,95** ECTS points (2,88 z 4,88),
- including the number of ECTS points for hours completed in the form of the student's independent work - **2,05** ECTS points (2,00 z 4,88).

Number of ECTS for hours in practical classes - **0,00**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-A CHEMIA ORGANICZNA

ECTS:6 ORGANIC CHEMISTRY

COURSE CONTENT

LECTURES

Structure and properties of organic chemistry. Isomerism phenomenon. Optical isomerism. Conformational analysis. Saturated hydrocarbons. Free radicals. SN1 and SN2 substitution reactions. E1 and E2 elimination reactions. Unsaturated hydrocarbons. Addition reactions. Aromatic hydrocarbons. SEAr reactions. Alcohols, phenols, ethers and their sulfur analogues. Aldehydes and ketones. Addition to carbonyl group. Carboxylic acids and their derivatives. Esterification reactions. Fats and soaps. Lipids. Amines. Diazonium salts and azo compounds. Amino acids and peptides. Heterocyclic compounds.

CLASSES

Organic chemistry calculation practice. Organic qualitative analysis. Basic laboratory techniques (crystallization, distillation, sublimation, extraction, chromatography). Organic synthesis. Use of UV-Vis spectrophotometry in organic chemistry. Computer-aided learning of organic chemistry.

EDUCATIONAL OBJECTIVE

During the course, the students are familiarised with particular classes of organic compounds. They are taught to understand the effect of the structure of molecule on the physical, chemical and biological properties of the given compound. Additionally, the emphasis is on the pro-ecological thinking by students - uses of principles of green chemistry in organic chemistry.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01+++, P1A_W03+++, P1A_W04+, P1A_W05+, P1A_W08+, P1A_U01+++, P1A_U02+, P1A_U03+, P1A_U04+++, P1A_U06+++, P1A_U07+, P1A_U09+++, P1A_U11+, P1A_K01+, P1A_K02+, P1A_K03+, P1A_K05++, P1A_K06+

Codes of learning outcomes in a major area of study K1_W05+++, K1_W26+, K1_U03+++, K1_U09+++, K1_U12+, K1_U16+, K1_K01+, K1_K03+, K1_K04+, K1_K06+

LEARNING OUTCOMES

Knowledge

W1 - able to identify and characterize the different classes of organic compounds (K1_W05)
W2 - able to design the synthesis of a specific organic compound (K1_W05)
W3 - understand the dependence between structure of molecule and its physical, chemical and biological properties (K1_W05)
W4 - understand principles of green chemistry (K1_W26)

Skills

U1 - able to detect the presence of main functional groups (K1_U03, K1_U09)
U2 - able to design and perform a simple organic synthesis (K1_U03, K1_U09)
U3 - able to confirm the structure of organic compounds by physicochemical methods (K1_U03, K1_U09)
U4 - able to create systematic names of organic compounds (K1_U12)
U5 - able to create 2D and 3D chemical structures with a molecule editor (K1_U16)

Social competence

K1 - able to use of chemical language in discussions with representatives of other sciences (K1_K01)
K2 - is open to work in a team (K1_K03)
K3 - is focused on raising awareness (K1_K04)
K4 - respect basic rules for chemical laboratory safety (K1_K06)

BASIC LITERATURE

1) 1) Morrison R. T., Boyd R. N., Bhattacharjee S. K., 2011r., "Organic chemistry", wyd. Pearson Education Singapore Pte Ltd, 2) 3) McMurry J., 2006r., "Fundamentals of Organic Chemistry", wyd. Wadsworth Publishing Company.

SUPPLEMENTARY LITERATURE

1) Furniss B. S., Hannaford A. J., Smith P. W. G., Tatchell A. R., 1989r., "Vogel's textbook of practical organic chemistry", wyd. Longman Group UK Limited.

Course/module:
ORGANIC CHEMISTRY
Fields of education: natural sciences
Course status: Compulsory
Course group: A-basic course
ECTS code: 13113-112-A
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/2

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 30/2
Classes: 45/5
Teaching forms and methods
Lectures
Lecture - lecture with a multimedia presentation (W1, W2, W3, W4, K1)
Classes
Laboratory classes - practical laboratory classes (U1, U2, U3, U4, U5, K1, K2, K3, K4)
Written examination (structured questions) - written exam (W1, W2, W3, W4, U4, K1, K3)
Written test 1 - knowledge test concerning exercises (U1, U2, U3, U4, U5, K2, K3, K4)
Report 2 - written report on the practical part of the training (U3, U4, U5)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 6
Language of instruction: English
Introductory courses: inorganic chemistry
Preliminary requirements: no indications

Name of the organizational unit offering the course:
Katedra Biochemii
Address: ul. Michała Oczapowskiego 1A, pok. 316, 10-719 Olsztyn
tel. 523-39-90, 523-48-83, tel./fax 535-20-15
Person in charge of the course:
dr Janusz Władysław Wasilewski
e-mail: janusz.wasilewski@uwm.edu.pl
Course coordinators:
dr Janusz Władysław Wasilewski

groups of 12 people

Detailed description of the awarded ECTS points - part B

CHEMIA ORGANICZNA

ECTS: 6 ORGANIC CHEMISTRY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- tutorial		3,0 h
- Participation in lectures		30,0 h
- Participation in classes		45,0 h
	TOTAL:	78,0 h

2. Student's independent work:

- development of laboratory reports		10,0 h
- preparation for exams		45,0 h
- preparation for colloquia		12,0 h
- preparation for laboratory exercises		8,0 h
	TOTAL:	75,0 h
	contact hours + student's independent work COMBINED TOTAL:	153,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 153,00 h: 25,00 h/ECTS = **6,12 ECTS**

on average **6 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **3,06** ECTS points (3,12 z 6,12),
- including the number of ECTS points for hours completed in the form of the student's independent work - **2,94** ECTS points (3,00 z 6,12).

Number of ECTS for hours in practical classes - **1,80**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-CF ENDOKRYNOLOGIA ROZRODU

ECTS:3 REPRODUCTION AND ENDOCRINOLOGY

COURSE CONTENT

LECTURES

Ovarian and testicular steroidogenesis. Role of peptide hormones and growth factors produced in the gonads. Hormonal regulation of the menstrual cycle. Hypothalamic-pituitary-gonadal axis. Interaction of branches of hypothalamic-pituitary-gonadal axis with nervous and immune system. Endocrine functions of the uterus and placenta. Rudiments of clinical endocrinology: lack of ovulation and polycystic ovaries, hirsutism, menopause and andropause, hormone replacement therapy.

CLASSES

Identification and examination of localization of gonadotrophic and lactotrophic pituitary cells. Investigation of steroidogenic activity in tissues of the reproductive system. Examination of mechanism of gonadotrophins influence on ovarian cells. Evaluation of functions of the accessory sex glands in sperm maturation. Evaluation of sperm motility.

EDUCATIONAL OBJECTIVE

Study of hormonal mechanisms controlling reproductive system and possibilities of intervention in their functions.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W02++, P1A_W04+++, P1A_W05+++, P1A_W07+++, P1A_W08+, P1A_W09+, P1A_U01+++, P1A_U05+, P1A_U06++, P1A_K01++, P1A_K02+, P1A_K03+, P1A_K05++, P1A_K06+, P1A_K07++, M1_W01+, M1_W02+, M1_W03+, M1_U01+, M1_U02+, M1_K01+, M1_K04+, M1_K07+

Codes of learning outcomes in a major area of study K1_W09+, K1_W14+, K1_W17+, K1_W28+, K1_W29+, K1_W30+, K1_W34+, Med_W+, K1_U01+, K1_U02+, K1_U08+, Med_U+, K1_K02+, K1_K03+, K1_K04+, K1_K05+, K1_K06+, Med_K+++

LEARNING OUTCOMES

Knowledge

W1 - Student has a thorough knowledge in the field of biology: he knows hormonal regulation of human reproductive system. Student has knowledge of the fundamentals of clinical endocrinology related to dysfunctions of the human reproductive system and possibilities of interference in its functioning (K1_W09, K1_W14, K1_W17, Med_W)

W2 - Student knows the principles of work in the laboratory and handling of biological material (K1_W28, K1_W29, K1_W30, K1_W34)

Skills

U1 - Student is able to assess proper functioning of the hormonal systems controlling the reproductive system in humans and animals. Student is able to perform laboratory analysis of endocrine activity of the gonads (K1_U01, K1_U02, K1_U08, Med_U)

Social competence

K1 - Student understands the need for lifelong learning and the development of professional and personal skills (K1_K02, K1_K04, K1_K05, Med_K)

K2 - Student can work in the group (K1_K03, Med_K)

K3 - Student respects principles of health and safety in the workplace (K1_K06, Med_K)

BASIC LITERATURE

1) P. Skałba, 2008r., "Endokrynologia ginekologiczna", wyd. PZWL , 2) T. Krzymowski (red.), 2007r., "Biologia rozrodu zwierząt. Fizjologiczna regulacja rozrodu u samic", wyd. Wydawnictwo UWM, 3) J. Strzeżek (red), 2007r., "Biologia rozrodu zwierząt. Biologiczne uwarunkowania wartości rozrodowej samca", wyd. Wydawnictwo UWM.

SUPPLEMENTARY LITERATURE

1) Nowak J., Zawilska J. (red.), 2004r., "Receptory i mechanizmy przekazywania sygnału", wyd. PWN.

Course/module:
REPRODUCTION AND ENDOCRINOLOGY
Fields of education: natural sciences
Course status: Optional
Course group: CF-
ECTS code: 13113-112-CF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: III/5

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 10/2
Classes: 25/5
Teaching forms and methods
Lectures
Lecture - informative lectures (W1, U1, K1)
Classes
Laboratory classes - laboratory classes (W1, W2, U1, K2, K3)
Written examination (structured questions) - evaluation of responses to structured questions (W1, U1, K1)
Report 1 - evaluation of the laboratory report (W1, W2, U1, K1, K2, K3)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 3
Language of instruction: English
Introductory courses: endocrinology, human physiology, biochemistry
Preliminary requirements: basic knowledge of endocrinology, human physiology and biochemistry

Name of the organizational unit offering the course:
Katedra Fizjologii Zwierząt
Address: ul. Michała Oczapowskiego 1A, pok. 223, 10-719 Olsztyn
tel. 523-32-01, fax 523-39-37
Person in charge of the course:
prof. dr hab. Tadeusz Szczepan Kamiński
Course coordinators:
prof. dr hab. Tadeusz Szczepan Kamiński

Detailed description of the awarded ECTS points - part B

ENDOKRYNOLOGIA ROZRODU

ECTS: 3 REPRODUCTION AND ENDOCRINOLOGY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:		
- consultations		1,0 h
- Participation in lectures		10,0 h
- Participation in classes		25,0 h
	TOTAL:	36,0 h
2. Student's independent work:		
- preparation for the written exam		20,0 h
- preparation of laboratory reports		15,0 h
	TOTAL:	35,0 h
	contact hours + student's independent work COMBINED TOTAL:	71,0h
Practical classes:		
- practical classes		h
		h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 71,00 h: 25,00 h/ECTS = **2,84 ECTS**

on average **3 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **1,52** ECTS points (1,44 z 2,84),
- including the number of ECTS points for hours completed in the form of the student's independent work - **1,48** ECTS points (1,40 z 2,84).

Number of ECTS for hours in practical classes - **0,80**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-C ENTERPRISE

ECTS:1 PRZEDSIĘBIORCZOŚĆ

COURSE CONTENT

LECTURES

Entrepreneurship and entrepreneur - what does it mean?. Types of entrepreneurship and entrepreneurial organizations. Policy-making and business execution. Determinants of choice of legal form of business. Business start-ups - the registration procedure. Forms of accounting. Obligations relating to retirement funds. The concept of the entrepreneur, micro-small and medium entrepreneurs. Barriers to the development of entrepreneurship. Infrastructure to support entrepreneurship. The specificity of the new technology ventures. Entrepreneurship in the area of biological and medical sciences. Academic entrepreneurship.

EDUCATIONAL OBJECTIVE

The aim of the lessons is to educate entrepreneurial attitudes and familiarize students with the principles of the organization and conduct of its business.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W11+, P1A_U07+, P1A_U08+, P1A_U10+, P1A_K01+, P1A_K07+

Codes of learning outcomes in a major area of study K1_W36+, K1_U15+, K1_K02+

LEARNING OUTCOMES

Knowledge

W1 - The student knows the general principles of operation of individual entrepreneurship in the field of applied biology and biotechnology (K1_W36)

Skills

U1 - The student knows how to prepare a presentation on their business idea. (K1_U15)

Social competence

K1 - The student can specify your own plans for a career after graduation. Indicates the opportunities and risks associated with these plans - he can identify which elements of these plans are enterprising and why. (K1_K02)

BASIC LITERATURE

1) Hougaard S., 2005r., "The business idea. The Early Stages of Entrepreneurship", wyd. Springer, s.228, 2) Muth H.P., Lloyd R., Gerlach F.H, 1998r., "Business planning", wyd. Eastern Publishing Ltd, s.149.

SUPPLEMENTARY LITERATURE

1) Petti C., 2009r., "Cases in Technological Entrepreneurship. Converting Ideas into Value", wyd. Edward Elgar Publishing Limited, s.177, 2) Wissema J.G., 2009r., "Towards the Third Generation University", wyd. Edward Elgar Publishing Inc., s. 271, 3) Cieślik J., 2006r., "Ambitious entrepreneurship - How to start your own business", wyd. Wydawnictwa Akademickie i Profesjonalne, s.443.

Course/module:
PRZEDSIĘBIORCZOŚĆ
Fields of education: natural sciences
Course status: Compulsory
Course group: C-specialty course
ECTS code: 13113-112-C
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: III/6

Type of course:lecture
Number of hours per semester/week:
Lectures: 15/2
Teaching forms and methods
Lectures
Lecture - The lectures using multimedia presentations, case studies, worksheets. (W1, U1, K1)
Written test 1 - Written test involving the issue of organizational and legal forms of enterprises, formal and legal responsibilities of individual entrepreneurship (person conducting business). (W1)
Presentation 1 (multimedia presentation) - Preparing a presentation in groups relating to their own business idea in the field of biological sciences. (W1, U1, K1)
Form and conditions of obtaining credit:
Graded credit
Number of ECTS points: 1
Language of instruction: English
Introductory courses: Basic of management
Preliminary requirements: Basic knowledge of the mechanisms of the market economy

Name of the organizational unit offering the course:
Katedra Organizacji i Zarządzania
Address: ul. Romana Prawocheńskiego 3, pok. 104, 10-720 Olsztyn
tel./fax 523-34-98
Person in charge of the course:
dr Marian Oliński
e-mail: molinski1@wp.pl
Course coordinators:
dr Krzysztof Krukowski, dr Marian Oliński

Detailed description of the awarded ECTS points - part B

ENTERPRISE

ECTS: 1 PRZEDSIĘBIORCZOŚĆ

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:		
- consultation		1,0 h
- Participation in lectures		15,0 h
	TOTAL:	16,0 h
2. Student's independent work:		
- own work of the student - preparation for the final test		9,0 h
	TOTAL:	9,0 h
	contact hours + student's independent work COMBINED TOTAL:	25,0h
Practical classes:		
- practical classes		h
		h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 25,00 h: 25,00 h/ECTS = **1,00 ECTS**

on average **1 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **0,64** ECTS points (0,64 z 1),
- including the number of ECTS points for hours completed in the form of the student's independent work - **0,36** ECTS points (0,36 z 1).

Number of ECTS for hours in practical classes - **0,00**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-B FIZJOLOGIA CZŁOWIEKA

ECTS:5 HUMAN PHYSIOLOGY

COURSE CONTENT

LECTURES

Structure and organization of the nervous system. Axis sensory and motor. Encoding and transmission of neural information. Synaptic conduction. Reticular, limbic and autonomic systems. The functioning of the senses. Composition and functions of blood. The regulation of hemopoiesis (hematopoiesis) and hemostasis (blood clotting). The functioning of the muscular system. The role of calcium ions in the contraction of the muscle. Types of contractions.

CLASSES

Comparison of the nervous and endocrine systems. Understanding the principles of the Power Lab 26T and its application to the study of reflexes. Analysis of the functioning of the senses. The functioning of nerve synapses - computer simulations. Analysis of human blood smears. Determination of blood parameters: hemoglobin, hematocrit, erythrocyte sedimentation rate, blood clotting time. Specify your own blood group. The molecular mechanism of muscle contraction-computer simulations. Registration contractions of isolated frog muscle. Interpretation of results and knowledge based on professional literature to describe and refere physiological issues.

EDUCATIONAL OBJECTIVE

Understanding the physiological processes, their regulation and links for maintaining homeostasis in the human body. Understanding the main physiological parameters as indicators of health. Ability to use different methods in the study of physiological processes. The ability to interpret the results based on performed experiments and professional references.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W02+, P1A_W04+++, P1A_W05+++, P1A_W06+, P1A_W07++, P1A_W08+, P1A_W09+, P1A_U01+++, P1A_U02+, P1A_U05++, P1A_U06+++, P1A_U07+, P1A_U08++, P1A_U10+, P1A_U11+, P1A_K02+, P1A_K03+, P1A_K04++, P1A_K05+, P1A_K06+, P1A_K07+

Codes of learning outcomes in a major area of study K1_W07+, K1_W09+, K1_W14+, K1_W17+++, K1_W28+, K1_W29+, K1_W33+, K1_W34+, K1_U03++, K1_U06++, K1_U07++, K1_U08+, K1_U10+, K1_U15+, K1_U16+, K1_K03+, K1_K05+, K1_K06+, K1_K07++

LEARNING OUTCOMES

Knowledge

W1 - The student defines the physiological processes of the human body (K1_W07, K1_W09, K1_W17)

W2 - The student describes the functions of the body at a general, organ, tissue, cellular levels (K1_W14, K1_W17)

W3 - The student selects appropriate methods of basic physiological processes and draws conclusions from such experiences (K1_W28, K1_W29, K1_W33)

W4 - The student characterizes physiological parameters (K1_W17)

W5 - The student knows the rules of working with biological material (K1_W34)

Skills

U1 - The student analyzes physiological processes (K1_U03, K1_U06)

U2 - The student recognizes correct and incorrect physiological parameters (K1_U03, K1_U06, K1_U07)

U3 - The student performs a simple physiological experiments (K1_U07, K1_U08)

U4 - The student clearly demonstrates the results their own,team and literature (K1_U10, K1_U15, K1_U16)

Social competence

K1 - The student recognizes the complexity of the physiological functioning of the body and during disease and shows a responsible attitude in relation to the living world (K1_K06, K1_K07)

K2 - The student is open to work in a team (K1_K03)

K3 - The student is focused on raising of knowledge (K1_K05)

K4 - The student acts in accordance with ethical rules (K1_K07)

BASIC LITERATURE

1) different authors, "scientific articles and popular science", 2) Ganong W.F., 2012r., "Review of Medical physiology".

SUPPLEMENTARY LITERATURE

Brak

Course/module:
HUMAN PHYSIOLOGY
Fields of education: natural sciences, medical sciences, health sciences and physical culture studies
Course status: Compulsory
Course group: B-major course
ECTS code: 13113-112-B
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: II/3

Type of course:lecture, laboratory classes, recitation classes
Number of hours per semester/week:
Lectures: 30/2
Classes: 30/3
Teaching forms and methods
Lectures
Lecture - informative with multimedia presentation (W1, W2, W4, U1, U2, K1, K4)
Classes
Recitation classes - seminars (W2, U4, K4)
Laboratory classes - laboratory (W3, W4, W5, U1, U2, U3, K2, K3)
Written test 1 - evaluation based of the written test (W2)
Presentation 1 (presentation analysis of literature, multimedia presentation, oral presentation) - evaluation of the presentation issues of the course (W1, W2, U4, K3)
Report 1 - evaluation of the written report (W1, W3, W4, W5, U1, U2, U3, K1, K2, K3, K4)
Form and conditions of obtaining credit:
Graded credit
Number of ECTS points: 5
Language of instruction: English
Introductory courses: cytology, biochemistry, human anatomy
Preliminary requirements: none

Name of the organizational unit offering the course:
Katedra Fizjologii Zwierząt
Address: ul. Michała Oczapowskiego 1A, pok. 223, 10-719 Olsztyn
tel. 523-32-01, fax 523-39-37
Person in charge of the course:
dr hab. Iwona Urszula Bogacka, prof. UWM
Course coordinators:
dr hab. Iwona Urszula Bogacka, prof. UWM

12-14 people in one group

Detailed description of the awarded ECTS points - part B

FIZJOLOGIA CZŁOWIEKA

ECTS: 5 HUMAN PHYSIOLOGY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- konsultation	1,0 h
- Participation in lectures	30,0 h
- Participation in classes	30,0 h
TOTAL:	61,0 h

2. Student's independent work:

- prepare for writting tests	25,0 h
- prepare for seminars	15,0 h
- prepare for classes	20,0 h
TOTAL:	60,0 h
contact hours + student's independent work COMBINED TOTAL:	121,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 121,00 h: 25,00 h/ECTS = **4,84 ECTS**

on average **5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,52** ECTS points (2,44 z 4,84),
- including the number of ECTS points for hours completed in the form of the student's independent work - **2,48** ECTS points (2,40 z 4,84).

Number of ECTS for hours in practical classes - **1,20**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-B FIZJOLOGIA CZŁOWIEKA

ECTS:6,5 HUMAN PHYSIOLOGY

COURSE CONTENT

LECTURES

Specificity of the myocardium. The functioning and the regulation of the circulatory system. The formation and significance of lymph. Regulation of breathing. The functioning of the digestive system. Composition and regulation of secretion of digestive juices. Function and regulation of liver function. The absorption of the products of digestion. The regulation of the human reproductive system. The menstrual cycle. The process of spermatogenesis. The regulation of conception, pregnancy, delivery and lactation. The formation and excretion of urine.

CLASSES

Examination of the cardiac cycle, pulse measurement, blood pressure and electrocardiogram analysis using the Power Lab 26T. The study of processes in the gastrointestinal tract. Examination of the activity of enzymes hydrolyzing carbohydrates, proteins and fats in various parts of the digestive system. Study of the effect of the environment on the activity of digestive enzymes. Observation of sperm and examine the impact of the environment on physical activity of sperm. Hormonal regulation of the menstrual cycle - determionation of the periovulatory stage. Early diagnosis of pregnancy. Determination of physical properties of the organic components and their detection in urine. Interpretation of results and knowledge based on professional literature to describe and refere physiological issues.

EDUCATIONAL OBJECTIVE

Understanding the physiological processes, their regulation and links for maintaining homeostasis in the human body. Understanding the main physiological parameters as indicators of health. Ability to use different methods in the study of physiological processes. The ability to interpret the results based on performed experiments and professional references.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W02+, P1A_W04+++, P1A_W05+++, P1A_W06+, P1A_W07++, P1A_W08+, P1A_W09+, P1A_U01+++, P1A_U02+, P1A_U05++, P1A_U06+++, P1A_U07+, P1A_U08++, P1A_U10+, P1A_U11+, P1A_K02+, P1A_K03+, P1A_K04++, P1A_K05+, P1A_K06+, P1A_K07+

Codes of learning outcomes in a major area of study K1_W07+, K1_W09+, K1_W14+, K1_W17+++, K1_W28+, K1_W29+, K1_W33+, K1_W34+, K1_U03++, K1_U06++, K1_U07++, K1_U08+, K1_U10+, K1_U15+, K1_U16+, K1_K03+, K1_K05+, K1_K06+, K1_K07++

LEARNING OUTCOMES

Knowledge

W1 - The student defines the physiological processes of the human body (K1_W07, K1_W09, K1_W17)

W2 - The student describes the functions of the body at a general, organ, tissue, cellular levels (K1_W14, K1_W17)

W3 - The student selects appropriate methods of basic physiological processes and draws conclusions from such experiences (K1_W28, K1_W29, K1_W33)

W4 - The student characterizes physiological parameters (K1_W17)

W5 - The student knows the rules of working with biological material (K1_W34)

Skills

U1 - The student analyzes physiological processes (K1_U03, K1_U06)

U2 - The student recognizes correct and incorrect physiological parameters (K1_U03, K1_U06, K1_U07)

U3 - The student performs a simple physiological experiments (K1_U07, K1_U08)

U4 - The student clearly demonstrates the results their own,team and literature (K1_U10, K1_U15, K1_U16)

Social competence

K1 - The student recognizes the complexity of the physiological functioning of the body and during disease and shows a responsible attitude in relation to the living world (K1_K06, K1_K07)

K2 - The student is open to work in a team (K1_K03)

K3 - The student is focused on raising of knowledge (K1_K05)

K4 - The student acts in accordance with ethical rules (K1_K07)

BASIC LITERATURE

1) different authors, "scientific articles and popular science", 2) Ganong W.F., 2007r., "Review of Human Physiology".

SUPPLEMENTARY LITERATURE

Brak

Course/module:
HUMAN PHYSIOLOGY
Fields of education: natural sciences, medical sciences, health sciences and physical culture studies
Course status: Compulsory
Course group: B-major course
ECTS code: 13113-112-B
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: II/4

Type of course:lecture, laboratory classes, recitation classes
Number of hours per semester/week:
Lectures: 30/2
Classes: 45/3
Teaching forms and methods
Lectures
Lecture - informative with multimedia presentation (W1, W2, W4, U1, U2, K1, K4)
Classes
Recitation classes - seminars (W2, U4, K4)
Laboratory classes - laboratory (W3, W4, W5, U1, U2, U3, K2, K3)
Written examination (structured questions) - evaluation of the written exam of learning outcomes acquired during lectures and classes (W1, W2, W4, W5, U1, U2, K1, K2)
Written test 1 - evaluation based on the written tests (W2)
Presentation 1 (presentation analysis of literature, multimedia presentation, oral presentation) - evaluation of the presentation issues of the course (W1, W2, U4, K3)
Report 1 - evaluation of the written reports (W1, W3, W4, W5, U1, U2, U3, K1, K2, K3, K4)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 6,5
Language of instruction: English
Introductory courses: cytology, biochemistry, human anatomy
Preliminary requirements: none

Name of the organizational unit offering the course:
Katedra Fizjologii Zwierząt
Address: ul. Michała Oczapowskiego 1A, pok. 223, 10-719 Olsztyn
tel. 523-32-01, fax 523-39-37
Person in charge of the course:
dr hab. Iwona Urszula Bogacka, prof. UWM
Course coordinators:
dr hab. Iwona Urszula Bogacka, prof. UWM

12-14 people in one group

Detailed description of the awarded ECTS points - part B

FIZJOLOGIA CZŁOWIEKA

ECTS: 6,5 HUMAN PHYSIOLOGY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultation		2,0 h
- Participation in lectures		30,0 h
- Participation in classes		45,0 h
	TOTAL:	77,0 h

2. Student's independent work:

- prepare for exam		30,0 h
- prepare for writting tests		25,0 h
- prepare for classes		25,0 h
	TOTAL:	80,0 h
	contact hours + student's independent work COMBINED TOTAL:	157,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 157,00 h: 25,00 h/ECTS = **6,28 ECTS**

on average **6,5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **3,19** ECTS points (3,08 z 6,28),
- including the number of ECTS points for hours completed in the form of the student's independent work - **3,31** ECTS points (3,20 z 6,28).

Number of ECTS for hours in practical classes - **1,80**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-A FIZYKA I

ECTS:4,5 PHYSICS

COURSE CONTENT

LECTURES

Newtonian mechanics: principles of dynamics, material points in force-fields, principles of conservation, rotation, oscillations and waves, rheology. Thermodynamics: Principles and basics, parameters i functions of the system, energy conservation, Carnot's Theorem, enthropy, applications, elements of statystical physics. Elektrodynamics: elctric and i magnetic field, Coulomb's and Biot-Savart laws, electromagnetic induction. Electric currents. Electromagmnetic waves: their sources and applications. Atomic and molecular physics. Nuclear physics. Molecular biophysics (elements).

CLASSES

Laboratory exercises (8) from various areas of pohysics, selected on the basis of potential applications in analysis and medicine

SEMINAR

Seminars on various subjects related to modern biophysical and biomedical research (mechanism of vision, single molecules etc.)

EDUCATIONAL OBJECTIVE

1) Aquiring basic knowledge on physical laws and phenomena which are applicable in experimental biology and medicine and explication of selected processes. 2) Development of motivations and capabilities of self-education in the areas of applying physical methods, including analyses, to biological and medical research. 3) Learning methods and capabilities of performing simple physical measurements using basic instruments. 4) Precise and clear presentation of own achievements 5) Development of capabilities of successful cooperation in scientific activity

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01+, P1A_W03+, P1A_U01++, P1A_U05+, P1A_U06+, P1A_K02+, P1A_K03+

Codes of learning outcomes in a major area of study K1_W03+, K1_U02+, K1_U03+, K1_K03+

LEARNING OUTCOMES

Knowledge

W1 - Aquiring basic knowledge on physical laws and phenomena which are applicable in experimental biology and medicine and explication of selected processes. (K1_W03)

Skills

U1 - Abilty to perform physical measurements using simple instruments and elaborating data in the form of laboratory protocol. Ability to formulate final conclusions. (K1_U02, K1_U03)

Social competence

K1 - Development of team work abilities (K1_K03)

BASIC LITERATURE

1) R. Resnick, D. Halliday, 2011r., "Physics, Part I, II", wyd. Wiley, 2) D. Halliday, R. Resnick, J.S. Walker, 2011r., "Fundamentals of Physics", wyd. Wiley, 3) J. D. Wilson, C. Hernandez-Hall, 2013r., "Physics Laboratory Experiments (9th ed)", wyd. Cengage.

SUPPLEMENTARY LITERATURE

1) Benjamin Crowell, 2013r., "Light and Matter", wyd. lighandmatter.com, 2) B. Crowell, 2013r., "Conceptual Physics", wyd. lighandmatter.com, 3) P. Davidovits, 2013r., "Physics in Biology and Medicine, 4th ed.", wyd. Elsevier.

Course/module:
PHYSICS
Fields of education: natural sciences
Course status: Compulsory
Course group: A-basic course
ECTS code: 13113-112-A
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/1

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 20/2
Classes: 30/3
Seminar: 10/2
Teaching forms and methods
Lectures
Lecture - multimedia-assisted lecture (W1)
Classes
Laboratory classes - Various laboratory excercises (U1, K1)
Report 1 - Expication of the prepared laboratory protocol (U1, K1)
Competency test 1 - Test "multiple choice" abt. 30 problems (W1)
Form and conditions of obtaining credit:
Examination
Number of ECTS points: 4,5
Language of instruction: English
Introductory courses: none
Preliminary requirements: elemetrary physics and mathematics (high-school level)

Name of the organizational unit offering the course:
Katedra Fizyki i Biofizyki
Address: ul. Michała Oczapowskiego 4, pok. 107, 10-719 Olsztyn
tel. 523-38-61, 523-34-06, fax 523-38-61
Person in charge of the course:
dr hab. Jacek Wierzchowski, prof. UWM
Course coordinators:
dr hab. Jacek Wierzchowski, prof. UWM

Detailed description of the awarded ECTS points - part B

FIZYKA I

ECTS: 4,5 **PHYSICS**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- Consultations and tests	7,0 h
- Lecture	0,0 h
- Participation in seminar	10,0 h
- Participation in lectures	20,0 h
- Participation in classes	30,0 h
- Laboratory excercises + seminar	0,0 h
TOTAL:	67,0 h

2. Student's independent work:

- Data processing and presentation	12,0 h
- Preparation for the final test	12,0 h
- Protocol preparation	10,0 h
- Theoretical preparation	10,0 h
TOTAL:	44,0 h
contact hours + student's independent work COMBINED TOTAL:	111,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 111,00 h: 25,00 h/ECTS = **4,44 ECTS**

on average **4,5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,72** ECTS points (2,68 z 4,44),
- including the number of ECTS points for hours completed in the form of the student's independent work - **1,78** ECTS points (1,76 z 4,44).

Number of ECTS for hours in practical classes - **1,60**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-BF GENETYKA ZACHOWANIA

ECTS:1 BEHAVIORAL GENETICS

COURSE CONTENT

LECTURES

Theoretical basis of behavioral genetics and research on the field of personality development; historical and philosophical perspective of behavioral genetics; research methods in behavioral genetics; the contribution of genetic and environmental factors in the overall variability of phenotypic traits or behavior; interaction and correlation between genotype and the environment; the role of experience and learning in shaping of the behavior; heritability of personality traits; epigenetics in behavioral genetics; the role of experiments in understanding of the mechanisms of development of personality traits and behavioral genetics; genetic research in psychiatry and psychology; genetic determinants of personality disorders, anxiety, stress, addictions and schizophrenia.

EDUCATIONAL OBJECTIVE

Presentation of the current state of knowledge on the developmental and behavioral genetics.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01+++, P1A_W02+, P1A_W04+++, P1A_W05+++, P1A_W07+++, P1A_W08++, P1A_U02+++, P1A_U03+++, P1A_U07+++, P1A_U08++, P1A_U09++, P1A_U10++, P1A_K01+, P1A_K04+, P1A_K05+++, P1A_K07+

Codes of learning outcomes in a major area of study K1_W06+++, K1_W10+++, K1_W29+, K1_W30+, K1_W32+, K1_U10++, K1_U11++, K1_U12+, K1_U13++, K1_K01+, K1_K04+, K1_K05+, K1_K07+

LEARNING OUTCOMES

Knowledge

W1 - describes the theoretical background of research on the field of behavioral genetics (K1_W06, K1_W10)

W2 - know the genetic and environmental determinants of human behavior (K1_W06, K1_W10)

W3 - describes the genetic processes associated with genetic determinants shaping personality traits and behavior (K1_W06, K1_W10)

W4 - characterize research methods which can be applied in the studies on the field of behavioral genetics (K1_W29, K1_W30, K1_W32)

W5 - describes examples of the research and its results on the field of behavior genetics (K1_W06)

Skills

U1 - use the genetic knowledge for the evaluation of the discoveries on the field of behavior genetics (K1_U11)

U2 - demonstrate the self-directed learning skills (K1_U10, K1_U12, K1_U13)

U3 - independently interprets and clarifies the data from the literature (K1_U10, K1_U11, K1_U13)

Social competence

K1 - recognizes the need to take into account the environmental and genetic determinants to explain many aspects of human behavior (K1_K01)

K2 - focused on improvement of the self-directed learning skills and icreasing of the knowledge (K1_K04, K1_K05)

K3 - follows the ethical code (K1_K07)

BASIC LITERATURE

1) Hood K.E., Halpern C.T., Greenberg G., Lerner R.M. (eds), 2010r., "Handbook of Developmental Science, Behavior, and Genetics", wyd. Oxford, England: Blackwell.

SUPPLEMENTARY LITERATURE

1) Plomin R., DeFries J.C., McClearn G.E., McGuffin P., 2008r., "Behavioral genetics", wyd. Worth Publishers.

Course/module:
BEHAVIORAL GENETICS
Fields of education: natural sciences
Course status: Optional
Course group: BF-
ECTS code: 13113-112-BF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: L/100

Type of course:lecture
Number of hours per semester/week:
Lectures: 15/2
Teaching forms and methods
Lectures
Lecture - Lecture with multimedia presentation and elements of discussion (W1, W2, W3, W4, W5, U1, U2, U3, K1, K2, K3)
Essay 1 - credits are obtained based on the essay that allows to veryfy acquired knowledge, skills and social competences (W1, W2, W3, W4, W5, U1, U2, U3, K1, K2, K3)
Evaluation of independent learning skills 1 - Validation of the ability to independently performed search of the data (literature) needed to prepare the essay (U2, U3, K2)
Form and conditions of obtaining credit:
Graded credit
Number of ECTS points: 1
Language of instruction: English
Introductory courses: Human genetics
Preliminary requirements: none

Name of the organizational unit offering the course:
Katedra Fizjologii, Genetyki i Biotechnologii Roślin
Address: ul. Michała Oczapowskiego 1A, 10-719 Olsztyn
tel. 523-48-24, fax 523-48-81
Person in charge of the course:
dr Piotr Paweł Androsiuk
e-mail: piotr.androsiuk@uwm.edu.pl
Course coordinators:
dr Piotr Paweł Androsiuk

Detailed description of the awarded ECTS points - part B

GENETYKA ZACHOWANIA

ECTS: 1 BEHAVIORAL GENETICS

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:		
- consultation		1,0 h
- Participation in lectures		15,0 h
	TOTAL:	16,0 h
2. Student's independent work:		
- preparation of final essay		10,0 h
	TOTAL:	10,0 h
	contact hours + student's independent work COMBINED TOTAL:	26,0h
Practical classes:		
- practical classes		h
		h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 26,00 h: 25,00 h/ECTS = **1,04 ECTS**

on average **1 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **0,62** ECTS points (0,64 z 1,04),
- including the number of ECTS points for hours completed in the form of the student's independent work - **0,38** ECTS points (0,40 z 1,04).

Number of ECTS for hours in practical classes - **0,00**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN
The Faculty of Biology and Biotechnology
Course/module syllabus - part A

13113-112-B HISTOLOGIA

ECTS:5 HISTOLOGY

COURSE CONTENT

LECTURES

The subject of the histology and its location in other sciences. The traditional and contemporary classification of tissues and cells. Structural and functional characteristics and location of individual tissues in the body: epithelial tissue, specialization of the cells areas of the epithelium and their connections; the connective tissue, the polymorphism, distinctive features of cells and intercellular substance; blood and lymph, morphotic elements and plasma; muscular tissue, nervous tissue, types of nerve and glial cells and contemporary concepts of glia cells role in functioning of the nervous system. Organs as structures built from many tissues. Types of organs in animals and man. Histological structure of organs forming the digestive system and respiratory system. Histology of the heart, blood vessels and lymphatic organs. Microscopic structure of kidneys and excretory ducts. Histology of male and female gonads and their ducts. Endocrine glands. Microscopic structure of the central nervous system (brain and spinal cord) and peripheral nervous system (nerves and ganglia). The autonomic nervous system. Histology of the skin (epidermis and dermis) and its organs (glands in the skin, hair, nails).

CLASSES

Self-observation and microscopic analysis of histological sections depicting selected organs of animals and humans. Recognition of various tissues in individual organs and analysis of their relationship. Recognition of artifacts. Documentation of microscopic observation in the form of drawings with descriptions. Self-recognition of tissue and organs under the microscope on the basis of histological specimens.

EDUCATIONAL OBJECTIVE

Familiarization with the microscopic structure of tissue and organs in animals and man and with the role of different tissues in the construction of these organs. Acquisition of skills to carry out self-microscopic observation of animal tissue and organs and correct interpretation of their structure on the basis of histological specimens. Acquisition of skills to recognize various animal tissue and organs based on microscopic images.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W04+++, P1A_W05+++, P1A_W06+, P1A_W07++, P1A_U01++, P1A_U02++, P1A_U03++, P1A_U06++, P1A_U07++, P1A_U08+++, P1A_U10+, P1A_U11+, P1A_K01++, P1A_K04+, P1A_K05+++, P1A_K07++, M1_W01++, M1_W02++, M1_W10++, M1_U02+, M1_K01+

Codes of learning outcomes in a major area of study K1_W13+, K1_W14+++, K1_W15+++, K1_W17+, K1_W28+, K1_W32+, K1_W33+, Med_W++, K1_U03+, K1_U08+, K1_U10+, K1_U12+, K1_U13+, K1_U16+, K1_U18++, Med_U+, K1_K01+, K1_K02+, K1_K04+, K1_K05+, K1_K07+, Med_K+

LEARNING OUTCOMES

Knowledge

W1 - Lists, defines and describes various tissues and organs of the human and animal body (K1_W14, K1_W15, Med_W)

W2 - Explains the organization of various organs and the role of individual tissues in these organs (K1_W13, K1_W14, K1_W15, K1_W17, Med_W)

W3 - Recognizes and categorizes each animal tissues and organ under the microscope (K1_W14, K1_W15)

W4 - Correctly interprets microscopic images of individual tissues and organs and distinguishes artifacts (K1_W14, K1_W28, K1_W32, K1_W33)

Skills

U1 - Understands and analyzes the structure of human and animal tissues and organs as well as is able to use specialized histological terminology (K1_U10, K1_U12, K1_U13, K1_U16, K1_U18)

U2 - Has the ability to self-microscopic observation, ie is able to operate the microscope, is able to interpret correctly the microscopic image, is able to recognize and seek out specific details in the microscopic image and to distinguish artifacts (K1_U03, K1_U08, Med_U)

U3 - Is able to perform the correct documentation from observation (K1_U18)

Social competence

K1 - Recognizes the complexity of the structure of the human and animal organism and the similarities in the construction of man and animals (K1_K01)

K2 - Is able to work alone (K1_K02)

K3 - Focused on increasing knowledge (K1_K04, K1_K05, Med_K)

K4 - - Acts in accordance with ethical principles (K1_K07)

BASIC LITERATURE

1) Mitchell B, Peel S, 2009r., "Histology An Illustrated Colour Text", wyd. Churchill Livingstone, 2) Stevens A., Lowe J., 2004r., "Human Histology 2nd or 3rd Edition", wyd. Mosby, 3) Ovalle W, Nahirney P, 2013r., "Netter's Essential Histology with Student Consult Access", wyd. Saunders, 4) Junqueira LC, Carneiro J, 2005r., "Basic Histology : Text and Atlas", wyd. McGraw-Hill Companies.

SUPPLEMENTARY LITERATURE

Brak

Course/module:
HISTOLOGY
Fields of education: natural sciences, medical sciences, health sciences and physical culture studies
Course status: Compulsory
Course group: B-major course
ECTS code: 13113-112-B
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/1

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 20/2
Classes: 50/4
Teaching forms and methods
Lectures
Lecture - Informative lectures with a multimedia presentation (W1, W2, U1, K3)
Classes
Laboratory classes - Laboratory classes - laboratory exercises with the use of microscopes (W2, W3, W4, U1, U2, U3, K1, K2, K3, K4)
Practical test 2 - Written test 2 - scoring verification system during the classes presented in Regulation of the course (recognition of animal organs on the basis of histological slides) (W2, W3, W4, U1, U2, K1, K2, K3, K4)
Oral test 4 - Oral test 4 - additional test for those students who did not receive the minimum number of points in the scoring verification system, presented in Regulation of course (W1, W2, U1, K2, K3)
Written test 1 - scoring verification system during the classes presented in Regulation of the course (evaluation of degree of assimilation of the material concerning the topics of single exercises and lectures) (W1, W2, U1, K2, K3)
Report 3 - Report 3 - documentation of microscopic observations-exercise book - evaluation of observation, drawings and descriptions correctness (W2, W3, W4, U1, U2, U3, K2, K4)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 5
Language of instruction: English
Introductory courses: lack of readings
Preliminary requirements: lack of readings

Name of the organizational unit offering the course:
Katedra Anatomii Porównawczej
Address: pl. Łódzki 3, pok. 302,, 10-727 Olsztyn
tel./fax 523-43-01
Person in charge of the course:
dr hab. Anna Aldona Robak, prof. UWM

e-mail: ankar@uwm.edu.pl
Course coordinators:
dr hab. Anna Aldona Robak, prof. UWM, dr Maciej Lucjan Równiak, dr Barbara Wasilewska

Detailed description of the awarded ECTS points - part B

HISTOLOGIA

ECTS: 5 **HISTOLOGY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultation	2,0 h
- Participation in lectures	20,0 h
- Participation in classes	50,0 h
TOTAL:	72,0 h

2. Student's independent work:

- lecture material constitutes the integral part of issues realized during exercises and knowledge is checked during the tests	15,0 h
- preparation for practical tests	10,0 h
- preparation for exercises	25,0 h
TOTAL:	50,0 h
contact hours + student's independent work COMBINED TOTAL:	122,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 122,00 h: 25,00 h/ECTS = **4,88 ECTS**

on average **5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,95** ECTS points (2,88 z 4,88),
- including the number of ECTS points for hours completed in the form of the student's independent work - **2,05** ECTS points (2,00 z 4,88).

Number of ECTS for hours in practical classes - **2,00**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-CF HODOWLE IN VITRO TKANEK ZWIERZĘCYCH

ECTS:5 METHODS OF IN VITRO CULTURES

COURSE CONTENT

LECTURES

Techniques of isolation and culture of cells in vitro. Composition of culture media. Function of ECM proteins in cell cultures. Methods of cell viability examination. Methods of cell transfection. Generation of cell lines. Application of in vitro cultures for scientific studies, medicine and industry. Rudiments of tissue engineering.

CLASSES

Preparation of culture media. Mechanical and enzymatic isolation of animal cells. Cell cultures: monolayer, on carriers, tissue slices, spheroids, aggregates. Tests evaluating cell viability. Investigation of proliferation and differentiation of cells in culture. Application of cell culture for toxicological assays. Cell encapsulation. Seminar: preparation of presentation based on scientific literature concerning cell culture and tissue engineering.

EDUCATIONAL OBJECTIVE

Learning of basal techniques of animal cell and tissue cultures in vitro as well as possibilities of their application for tissue engineering.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W02+++, P1A_W04+++, P1A_W05++, P1A_W07+++, P1A_W08+++, P1A_W09+, P1A_U01+++, P1A_U02+++, P1A_U03++, P1A_U05++, P1A_U06+++, P1A_U07+++, P1A_U08+, P1A_U09+, P1A_U10+, P1A_U11+, P1A_K01++, P1A_K02+, P1A_K03+, P1A_K04+, P1A_K05+++, P1A_K06+, P1A_K07++, M1_W01++, M1_W03++, M1_U01++, M1_U02++, M1_U13+, M1_K01+, M1_K04+, M1_K07+

Codes of learning outcomes in a major area of study K1_W07+, K1_W09+, K1_W27+, K1_W28+, K1_W29+, K1_W30+++, K1_W32+++, K1_W34+, Med_W++, K1_U03+, K1_U06++, K1_U07++, K1_U08+, K1_U10+, K1_U11+, K1_U12+, K1_U13+, K1_U16+, Med_U+++, K1_K01+, K1_K02+, K1_K03+, K1_K04+, K1_K05+, K1_K06+, K1_K07+, Med_K+++

LEARNING OUTCOMES

Knowledge

W1 - Student is familiar with methods of cell and tissue cultures in vitro (K1_W07, K1_W09, K1_W27, K1_W30, K1_W32, Med_W)

W2 - Student is experienced in rules valid in in vitro laboratory. (K1_W28, K1_W30, K1_W32, K1_W34)

W3 - Student has the knowledge, which enables him to make simple in vitro experiment and analyze results of the experiment. (K1_W29, K1_W30, K1_W32, Med_W)

Skills

U1 - Student knows how to apply methods of cell and tissue cultures in vitro (K1_U06, K1_U07, Med_U)

U2 - Student is able to make simple experiment pertaining to cultures in vitro. (K1_U03, K1_U06, K1_U07, K1_U08, Med_U)

U3 - Student prepares presentation based on scientific literature concerning cell culture and tissue engineering. (K1_U10, K1_U11, K1_U12, K1_U13, K1_U16, Med_U)

Social competence

K1 - Student understands the need for lifelong learning and the development of professional and personal skills. (K1_K01, K1_K02, K1_K04, K1_K05, Med_K)

K2 - Student can work in the group. (K1_K03, Med_K)

K3 - Student respects principles of health and safety in the workplace (K1_K06, Med_K)

K4 - Student understands of importance of ethical conduct concerning biological material (K1_K07)

BASIC LITERATURE

1) S. Stokłosowa, 2004r., "Hodowla komórek i tkanek,", wyd. PWN.

SUPPLEMENTARY LITERATURE

Brak

Course/module:
METHODS OF IN VITRO CULTURES
Fields of education: natural sciences, medical sciences, health sciences and physical culture studies
Course status: Optional
Course group: CF-
ECTS code: 13113-112-CF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: II/4

Type of course:lecture, laboratory classes, recitation classes
Number of hours per semester/week:
Lectures: 10/1
Classes: 50/5
Teaching forms and methods
Lectures
Lecture - informational lecture (W1, W2, W3, U1, K1, K4)
Classes
Recitation classes - seminars (W1, W3, U3, K2)
Laboratory classes - laboratory classes (W1, W2, W3, U1, U2, K2, K3, K4)
Written test 1 - evaluation of the written test (W1, U1, K1)
Presentation 1 (presentation analysis of literature, multimedia presentation, oral presentation) - evaluation of active participation in seminars (W1, U3, K1, K2)
Report 1 - evaluation of the report of the classes (W1, W2, W3, U1, U2, K2, K3, K4)
Form and conditions of obtaining credit:
Graded credit
Number of ECTS points: 5
Language of instruction: English
Introductory courses: human physiology, biochemistry
Preliminary requirements: basic knowledge of human physiology

Name of the organizational unit offering the course:
Katedra Fizjologii Zwierząt
Address: ul. Michała Oczapowskiego 1A, pok. 223, 10-719 Olsztyn
tel. 523-32-01, fax 523-39-37
Person in charge of the course:
prof. dr hab. Tadeusz Szczepan Kamiński
Course coordinators:
prof. dr hab. Tadeusz Szczepan Kamiński

Detailed description of the awarded ECTS points - part B

HODOWLE IN VITRO TKANEK ZWIERZĘCYCH

ECTS: 5 METHODS OF IN VITRO CULTURES

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:		
- consultations		1,0 h
- Participation in lectures		10,0 h
- Participation in classes		50,0 h
	TOTAL:	61,0 h
2. Student's independent work:		
- preparing scientific presentations		10,0 h
- prepare for the written test		30,0 h
- preparation of laboratory reports		20,0 h
	TOTAL:	60,0 h
	contact hours + student's independent work COMBINED TOTAL:	121,0h
Practical classes:		
- practical classes		h
		h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 121,00 h: 25,00 h/ECTS = **4,84 ECTS**

on average **5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,52** ECTS points (2,44 z 4,84),
- including the number of ECTS points for hours completed in the form of the student's independent work - **2,48** ECTS points (2,40 z 4,84).

Number of ECTS for hours in practical classes - **1,00**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-BF IDENTYFIKACJA GENÓW

ECTS:3 GENOME ANNOTATION

COURSE CONTENT

LECTURES

The construction of the gene and genome. Methods for DNA sequencing. Strategies for sequencing of the genomes. Molecular databases NCBI, EMBL-EBI, DDBJ. Application of computer programs (BLAST, CLUSTAL, PHYLIX, and others) in the analysis of nucleotide and protein sequences, Identification of the coding sequences in the genomic DNA based on fixed characteristics of gene sequences. Application of the genetic maps in gene identification. ESTs sequencing in analyses of genes with similar structure and function. The application of mutants for the identification of genes. Identification of genes responsible for antibiotic resistance in microorganisms. Phylogenetic analysis of the sequences. Genome sequencing projects.

CLASSES

Getting acquainted with the molecular databases: NCBI, EMBL-EBI and DDBJ. The structure of the NCBI record. UNIGENE database. Translation of the nucleotide sequence and characterization of obtained protein. In silico searching for restriction enzymes sites within sequences: ESTs databases. Getting acquainted with the genome sequencing projects and ESTs. Identification of the coding sequences with BLAST . Phylogenetic analyses.

EDUCATIONAL OBJECTIVE

To acquaint the student with the latest trends in molecular genetics associated with application of the computer techniques and modeling in information processing; application of data from biological databases in basic analysis of DNA sequences and proteins and identification of functional elements of the genome.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01+, P1A_W02+, P1A_W04+++, P1A_W05+, P1A_W06+++, P1A_W10+++, P1A_U02++, P1A_U03+++, P1A_U04+++, P1A_U07+++, P1A_U08+++, P1A_U09+++, P1A_U10++, P1A_K01++, P1A_K02+, P1A_K03+, P1A_K05+++, P1A_K07++

Codes of learning outcomes in a major area of study K1_W02+, K1_W06+, K1_W31+++, K1_W33++, K1_W37+++, K1_U09+++, K1_U12++, K1_U13++, K1_U18+++, K1_K03+, K1_K04++, K1_K05++

LEARNING OUTCOMES

Knowledge

W1 - lists and describes the database and software applicable to the identification of genes, protein modeling and phylogenetic analyzes (K1_W31, K1_W33, K1_W37)

W2 - describes the examples of genome sequencing projects for plants, animals and microorganisms (K1_W06, K1_W37)

W3 - has knowledge of the sequence alignment algorithms (K1_W02, K1_W31, K1_W37)

W4 - has knowledge of the phylogenetic analysis (K1_W31, K1_W33, K1_W37)

Skills

U1 - use the databases containing information about genes, genomes and proteins (K1_U09, K1_U12, K1_U13)

U2 - identifies the functional elements of the genome (K1_U09, K1_U18)

U3 - performs analysis of the nucleotide and protein sequence of the selected gene (K1_U09, K1_U18)

U4 - Performs the analysis which aim is to predict the functions and modeling of protein structure (K1_U09, K1_U18)

U5 - performs the phylogenetic analysis based on the sequences (K1_U09, K1_U12, K1_U13)

Social competence

K1 - works in group of students (K1_K03)

K2 - has the ability to analytical thinking, has the ability to perceive and to disclose the relationship between the various data (K1_K04, K1_K05)

K3 - shows creativity in the search for knowledge, is active in application of the possesed knowledge (K1_K04, K1_K05)

BASIC LITERATURE

1) Baxevanisa A. D., Ouellette B. F. F., 2005r., "Bioinformatyka: podręcznik do analizy genów i białek.", wyd. PWN, Warszawa, 2) Higgs P. G., Attwood T. K, 2008r., "Bioinformatyka i ewolucja molekularna.", wyd. PWN, Warszawa, 3) Polok K., 2010r., "Protein prediction methods- steps of analysis.", wyd. Wyd. GeneCrop, Department of Genetics., 4) Polok K., 2010r., "From sequence to biological meaning.", wyd. Wyd. Studio Piligrafii Komputerowej SQL, Olsztyn.

SUPPLEMENTARY LITERATURE

1) Polok K., 2010r., "Plant Genetics and Genomics", wyd. Wyd. SQL Olsztyn..

Course/module:
GENOME ANNOTATION
Fields of education: natural sciences
Course status: Optional
Course group: BF-
ECTS code: 13113-112-BF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: L/100

Type of course:computer-aided classes, lecture
Number of hours per semester/week:
Lectures: 15/2
Classes: 30/5
Teaching forms and methods
Lectures
Lecture - Lecture with the multimedia presentation. (W1, W2, W3, W4, K2, K3)
Classes
Computer-aided classes - Application of bioinformatics tools in solving tasks on the field of molecular genetics. (U1, U2, U3, U4, U5, K1, K2, K3)
Teamwork assessment 1 - Evaluation of the active participation of the students in classes which require cooperation in student groups in order to perform the entrusted tasks and in the discussion. (K1, K3)
Test assignment 2 - A final test (set of practical exercises) which control the knowledge and skills gained during the lectures and exercises; the test enable also the verification of specific social skills. (W1, W2, W3, W4, U1, U2, U3, U4, U5, K2, K3)
Report 1 - Reports from the classes (U1, U2, U3, U4, U5, K1, K2)
Form and conditions of obtaining credit: Graded credit
Number of ECTS points: 3
Language of instruction: English
Introductory courses: Human genetics
Preliminary requirements: computer skills

Name of the organizational unit offering the course:
Katedra Fizjologii, Genetyki i Biotechnologii Roślin
Address: ul. Michała Oczapowskiego 1A, 10-719 Olsztyn
tel. 523-48-24, fax 523-48-81
Person in charge of the course:
dr Piotr Paweł Androsiuk
e-mail: piotr.androsiuk@uwm.edu.pl
Course coordinators:
dr Piotr Paweł Androsiuk

Optimal number of participants: 12-15

Detailed description of the awarded ECTS points - part B

IDENTYFIKACJA GENÓW

ECTS: 3 GENOME ANNOTATION

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:		
- consultation		2,0 h
- Participation in lectures		15,0 h
- Participation in classes		30,0 h
	TOTAL:	47,0 h
2. Student's independent work:		
- preparation for the classes		7,0 h
- preparation for the final test		10,0 h
- preparation of the reports from the classes		5,0 h
	TOTAL:	22,0 h
	contact hours + student's independent work COMBINED TOTAL:	69,0h
Practical classes:		
- practical classes		h
		h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 69,00 h: 25,00 h/ECTS = **2,76 ECTS**

on average **3 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,04** ECTS points (1,88 z 2,76),
- including the number of ECTS points for hours completed in the form of the student's independent work - **0,96** ECTS points (0,88 z 2,76).

Number of ECTS for hours in practical classes - **1,00**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-B IMMUNOLOGIA I PODSTAWY IMMUNOTERAPII

ECTS:5 IMMUNOLOGY AND BASICS OF IMMUNOTHERAPY

COURSE CONTENT

LECTURES

Basics of the immune system. Structure and function of the lymphatic system lymphoid organs. The types of immune cells - line lymphoid and myeloid line. Formation, forms and mechanisms of innate immunity. Resistance specific cellular and humoral. The types of antigens and antigen presentation mechanisms. Specific T cells and the cellular response. The mechanisms of cytotoxicity and their role. B cells and specific antibody response. Structure and function of antibodies. Interaction of T and B lymphocytes. Allergy. Tumor immunology. The role of cytokines in the regulation of immune system. Mechanisms of immune memory. Major Histocompatibility Complex. Mechanisms of immune tolerance and autoimmunity. Phylogeny and ontogeny of the immune system. Basic of immunotherapy.

CLASSES

Isolation, identification and calculation of the number of white blood cells. Preparing of blood smear and its analysis. Acquisition and identification of of coelomocytes. Techniques for isolating lymphoid organs and cells of the immune system of mice, preparing suspensions of a certain cell density and its viability. Determination of erythrocyte sedimentation rate depending on the concentration of immunoglobulins in serum. Observation of of red blood cells aglutination. The study of phagocytosis in vitro. Evaluation of the ability of leukocytes and the formation of reactive oxygen. The blood group systems. . Methods of immunization. The use of markers in the diagnosis of cancer dvelopment. Allergy tests. Visit in the diagnostic laboratory.

EDUCATIONAL OBJECTIVE

Understanding of the basic mechanisms for determining the function of immune system. Acquisition of skills conducting simple experiments in the field of immunology. Acquisition of competence for the safe operation of biological material. Knowledge of the role and possibilities of immunotherapy using.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W04+++, P1A_W05+++, P1A_W07+++, P1A_W08++, P1A_W09++, P1A_U01+++, P1A_U02++, P1A_U03++, P1A_U06+++, P1A_U07++, P1A_U08+, P1A_U09+, P1A_U10+, P1A_K02+, P1A_K03+, P1A_K04++, P1A_K05+, P1A_K07+

Codes of learning outcomes in a major area of study K1_W09+, K1_W17+, K1_W18++, K1_W32++, K1_W34++, K1_U03++, K1_U04++, K1_U07+, K1_U10+, K1_U12+, K1_U13+, K1_K03+, K1_K05+, K1_K07++

LEARNING OUTCOMES

Knowledge

W1 - Knows molecular mechanisms which determine the function of immune system. (K1_W09, K1_W17, K1_W18, K1_W32, K1_W34)

W2 - Knows basic methods and meaning of immunotherapy. (K1_W18, K1_W32, K1_W34)

Skills

U1 - Recognizes white bood cells. (K1_U03, K1_U04)

U2 - Can perfome simple experiments in the field of immunology. (K1_U03, K1_U04, K1_U07)

U3 - Is able to demonstrate results obtained during the experiments in the field of immunology. (K1_U10, K1_U12, K1_U13)

Social competence

K1 - Is able to work as a team member. (K1_K03)

K2 - Is able to learn in the target manner. (K1_K05)

K3 - Is aware of responsibility in assessing the risks arising from the use of biological tools. (K1_K07)

K4 - Minimizes the risk of laboratory work with biological material. (K1_K07)

BASIC LITERATURE

1) JAKUB JAKÓBISIAK, 2002r., "Immunologia", wyd. PWN, t.-, s.-, 2) D Male, 2006r., "Immunologia", wyd. Urban&partner, t.-, s.-.

SUPPLEMENTARY LITERATURE

1) Bogdan Solnicy, 2008r., "Podstawy serologii grup krwi. Podręcznik dla studentów oddziału analityki medycznej", wyd. Wyd. UJ, t.-, s.-, 2) Jacob Michael, 2007r., "Normy laboratoryjne", wyd. Via Medica, t.-, s.-, 3) N.A. Brunzel, 2010r., "Diagnostyka laboratoryjna", wyd. Urban & Partner, t.1 i 2, s.-, 4) Literatura naukowa zalecana na seminarium, 2011r., "-", wyd. -, t.-, s.-, 5) Wiesław Deptuła, 2008r., "Immunologia dla biologów", wyd. Uniwersytet Szczeciński, t.-, s.5-151.

Course/module:
IMMUNOLOGY AND BASICS OF IMMUNOTHERAPY
Fields of education: natural sciences, medical sciences, health sciences and physical culture studies
Course status: Compulsory
Course group: B-major course
ECTS code: 13113-112-B
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: III/5

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 20/2
Classes: 30/2
Teaching forms and methods
Lectures
Lecture - lecture with presentation (W1, W2)
Classes
Laboratory classes - experiments and laboratory tests (U1, U2, U3, K1, K2, K3, K4)
Written test 1 - test (W1, W2)
Practical test 1 - practical test (W1, W2, U1, U2, K2, K3, K4)
Presentation 1 (multimedia presentation, oral presentation) - oral presentation of selected topic (U3, K1, K2)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 5
Language of instruction: Polish
Introductory courses: anatomy, physiology, biochemistry
Preliminary requirements: knowledge of basic safety rules and rules for carrying out biological experiments, knowledge of the physiological processes

Name of the organizational unit offering the course:
Katedra Fizjologii Zwierząt
Address: ul. Michała Oczapowskiego 1A, pok. 223, 10-719 Olsztyn
tel. 523-32-01, fax 523-39-37
Person in charge of the course:
dr hab. inż. Anita Franczak, prof. UWM
e-mail: anitaf@uwm.edu.pl
Course coordinators:
dr hab. inż. Anita Franczak, prof. UWM

none

Detailed description of the awarded ECTS points - part B

IMMUNOLOGIA I PODSTAWY IMMUNOTERAPII

ECTS: 5 IMMUNOLOGY AND BASICS OF IMMUNOTHERAPY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:	
- consultations	10,0 h
- Participation in lectures	20,0 h
- Participation in classes	30,0 h
TOTAL:	60,0 h
2. Student's independent work:	
- Preparing for final exam	10,0 h
- Independent student's work: preparing for laboratory exercises, preparation of laboratory reports and presentations, preparation for tests, preparing for the final exam	50,0 h
TOTAL:	60,0 h
contact hours + student's independent work COMBINED TOTAL:	120,0h
Practical classes:	
- practical classes	30,0 h
	30,0 h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 120,00 h: 25,00 h/ECTS = **4,80 ECTS**

on average **5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,50** ECTS points (2,40 z 4,8),
- including the number of ECTS points for hours completed in the form of the student's independent work - **2,50** ECTS points (2,40 z 4,8).

Number of ECTS for hours in practical classes - **1,40**

Number of ECTS for hours in practical classes - **1,50**

Number of ECTS for hours in professional practice - **0,75**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-CF MEDICAL MICROBIOLOGY AND MYCOLOGY

ECTS:7 MEDICAL MICROBIOLOGY AND MYCOLOGY

COURSE CONTENT

LECTURES

Bacterial and fungial morphology, structures, metabolism and growth.The significance of genetic variation (in drug resistance, pathogenesis or virulence and variation, diagnosis, and vaccination). Normal human microbiota (Role of the resident microbiota, and locations in the human body). Virulence of bacteria, bacterial virulence factors and their regulation (exotoxin, endotoxin, and their contribution to pathogenesis).Immune Responses to bacterial Infections. Antimicrobial chemotherapy, drug resistance and its prevention, laboratory diagnosis, control of bacterial diseases.

CLASSES

Introduction to Diagnostic Microbiology; Microbiology Specimen Collection and Transport. Bacterial and fungial cultivations. Microbiological diagnostic of Streptococcus and Staphylococcus Microbiological diagnostic of gram-negative rods. The influence of physical and chemical factors on microorganisms; General principles of antibiotic therapy. Anaerobic microorganisms.

EDUCATIONAL OBJECTIVE

The aim of this course is to introduce basic principles and application relevance of clinical disease. The content of rigorous course includes many etiological agents responsible for global infectious diseases. It covers all biology of bacteria and fungi related with infectious diseases. The course will provide the conceptual basis for understanding pathogenic microorganisms and particularly address the fundamental mechanisms of their pathogenicity.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01+, P1A_W04+++, P1A_W05++, P1A_W07+, P1A_W08+, P1A_U01++, P1A_U02+, P1A_U03+, P1A_U06+, P1A_U07+, P1A_U08+, P1A_K06+

Codes of learning outcomes in a major area of study K1_W06+, K1_W16+, K1_W32+, K1_U04+, K1_U08+, K1_U12+, K1_U18+, K1_K06+

LEARNING OUTCOMES

Knowledge

W1 - Define principles of microbial taxonomy, structure, physiology, genetics, immunology and pathogenesis (K1_W16)

W2 - Understand the principles of prevention and treatment of pathogenic microorganism infection in humans (K1_W06)

W3 - Develop a knowledge of microbial organisms and their relevance of infectious diseases (K1_W32)

Skills

U1 - Familiar skill of the laboratory use in diagnose infections, including appropriate specimen collection and selection of tests (K1_U04)

U2 - Develop the ability to manipulate the laboratory tests to identify pathogenic microorganisms (K1_U08)

U3 - Understand the principles of the laboratory tests in diagnosis and identification of pathogenic microorganisms (K1_U12)

U4 - Use the specialised research language in the microbiology field (K1_U18)

Social competence

K1 - Responsibility for the biosafety in the medical microbiology laboratory (K1_K06)

BASIC LITERATURE

1) Murray P., Rosenthal K., Pfaller M., 2009r., "Biologia molekularna bakterii", wyd. Elsevier.

SUPPLEMENTARY LITERATURE

1) Scientific publications, ""Journal of Medical Microbiology", "Journal of Microbiology"".

Course/module:
MEDICAL MICROBIOLOGY AND MYCOLOGY
Fields of education: natural sciences
Course status: Compulsory
Course group: CF-
ECTS code: 13113-112-CF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/2

Type of course:lecture, laboratory classes, recitation classes
Number of hours per semester/week:
Lectures: 20/2
Classes: 60/5
Teaching forms and methods
Lectures
Lecture - presentations with discussions (W1, W2, W3, U4, K1)
Classes
Recitation classes - seminars (W1, U1, K1)
Laboratory classes - lab experiments (W1, W3, U1, U2, U3, K1)
Written examination (multiple-choice test) - Final test consists of 60 questions (W1, W2, W3, U3, U4, K1)
Practical test 3 - Practical lab exam (W1, W3, U2, U4, K1)
Report 2 - Report from lab experiments with discussion (W3, U1, K1)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 7
Language of instruction: English
Introductory courses: without requirements
Preliminary requirements: without requirements

Name of the organizational unit offering the course:
Katedra Mikrobiologii
Address: M.Oczapowskiego 1A, 208, 10-719 Olsztyn
523-45-67
Person in charge of the course:
prof. dr hab. Aleksander Wacław Świątecki
e-mail: aswiat@uwm.edu.pl
Course coordinators:
dr inż. Justyna Możejko, prof. dr hab. Aleksander Wacław Świątecki

Detailed description of the awarded ECTS points - part B

MEDICAL MICROBIOLOGY AND MYCOLOGY

ECTS: 7 **MEDICAL MICROBIOLOGY AND MYCOLOGY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultations		2,0 h
- Participation in lectures		20,0 h
- Participation in classes		60,0 h
	TOTAL:	82,0 h

2. Student's independent work:

- preparing for lab practical exam		30,0 h
- preparing for labs		30,0 h
- preparing a laboratory report		30,0 h
	TOTAL:	90,0 h
	contact hours + student's independent work COMBINED TOTAL:	172,0h

Practical classes:

- practical classes	20,0 h
	20,0 h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 172,00 h: 25,00 h/ECTS = **6,88 ECTS**

on average **7 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **3,34** ECTS points (3,28 z 6,88),
- including the number of ECTS points for hours completed in the form of the student's independent work - **3,66** ECTS points (3,60 z 6,88).

Number of ECTS for hours in practical classes - **1,20**

Number of ECTS for hours in practical classes - **1,00**

Number of ECTS for hours in professional practice - **0,50**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-CF METHODS OF HUMAN MOLECULAR DIAGNOSTICS

ECTS:4,5 METHODS OF HUMAN MOLECULAR DIAGNOSTICS

COURSE CONTENT

CLASSES

Practical application of selected methods for the diagnostics of various genetic markers. Isolation of gDNA - as a template for medical diagnostics. Molecular diagnosis of sex based on the length of amelogenin gene. Identification of short tandem repeat polymorphism (STR) in the human genome. Forensic individualization based on the length amplicons of selected genetic markers. Identification of selected genetic mutations (e.g.detection of deletions in the human CCR5 receptor gene - resistance to the HIV virus). Implementation of human chromosome preparations using cell cultures. Chromosome staining using classical cytogenetic techniques. Microscopic analysis of chromosome slides. Application of classical staining of the chromosomes in the diagnosis of chromosomal abnormalities. Staining chromosome using techniques of molecular cytogenetics (FISH). Use specific software and online tools in the diagnosis of human chromosome. Molecular diagnostics of selected genetic diseases (seminar).

EDUCATIONAL OBJECTIVE

Acquainting the student with the methods of human molecular diagnostics.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01++, P1A_W02+++, P1A_W03+, P1A_W04+++, P1A_W05+++, P1A_W06+++, P1A_W07+++, P1A_W08+++, P1A_W09+, P1A_W10+, P1A_U01+++, P1A_U02+++, P1A_U03++, P1A_U04++, P1A_U05++, P1A_U06+++, P1A_U07+++, P1A_U08+++, P1A_U09+++, P1A_U10++, P1A_U11+, P1A_U12+, P1A_K01++, P1A_K02+, P1A_K03+, P1A_K04+, P1A_K05+++, P1A_K06++, P1A_K07++, P1A_K08++, M1_W01++, M1_W02++, M1_W03++, M1_W04++, M1_W05++, M1_W06++, M1_W07++, M1_W08++, M1_W09++, M1_W10++, M1_W11++, M1_W12++, M1_U01+++, M1_U02+++, M1_U03+++, M1_U04+++, M1_U05+++, M1_U06+++, M1_U07+++, M1_U08+++, M1_U09+++, M1_U10+++, M1_U11+++, M1_U12+++, M1_U13+++, M1_U14+++, M1_K01+++, M1_K02+++, M1_K03+++, M1_K04+++, M1_K05+++, M1_K06+++, M1_K07+++, M1_K08+++, M1_K09+++

Codes of learning outcomes in a major area of study K1_W03+, K1_W06+, K1_W10+, K1_W12+++, K1_W28+, K1_W29+++, K1_W30++, K1_W31+, K1_W32++, K1_W33+++, K1_W34+, Med_W++, K1_U04+++, K1_U05+++, K1_U06++, K1_U07++, K1_U08++, K1_U09++, K1_U10+, K1_U11+, K1_U12+, K1_U13+, K1_U15+, K1_U16+, K1_U17+, K1_U18+, Med_U+++, K1_K01+, K1_K02+, K1_K03+, K1_K04+, K1_K05+, K1_K06++, K1_K07+, K1_K08++, Med_K+++

LEARNING OUTCOMES

Knowledge

W1 - knows and understands the processes occurring in the methods of human molecular diagnostics (K1_W03, K1_W06, K1_W12, K1_W29, K1_W33, Med_W)

W2 - knows the basic genetic techniques of human molecular diagnostics (K1_W12, K1_W28, K1_W29, K1_W30, K1_W31, K1_W32, K1_W33, Med_W)

W3 - knows the basic principles of ergonomics, health and safety of biological material (K1_W29, K1_W30, K1_W34)

W4 - indicates the possibilities and limitations of application of cytogenetic research methods (K1_W10, K1_W12)

W5 - using the most appropriate approach in preparing and analysis of the chromosome slides in cytogenetic analysis (K1_W33)

W6 - explains patterns and characterized the various stages of conducting cytogenetical diagnostic analysis (K1_W32)

Skills

U1 - knows how to use basic genetic techniques of molecular diagnostics (K1_U04, K1_U05, K1_U06, K1_U07, K1_U08, K1_U09, Med_U)

U2 - is able to perform simple diagnostic tests using biological material (K1_U04, K1_U05, K1_U06, K1_U07, K1_U08, K1_U09, Med_U)

U3 - is able to prepare and convey scientific information in the field of molecular diagnostics on the basis of independently collected the available literature (K1_U10, K1_U11, K1_U12, K1_U13, K1_U15, K1_U16, K1_U17, K1_U18, Med_U)

U4 - is able to schedule a cytogenetic analysis (K1_U04)

U5 - uses different methods for the preparation and staining of chromosomes and cytogenetic analysis (K1_U05)

U6 - analyzes the number and structure of chromosomes for use in the cytogenetic diagnosis of human, interprets the results (Med_U)

Social competence

K1 - understands the need for lifelong learning and improving their skills (K1_K01, K1_K02, K1_K04, K1_K05, K1_K08, Med_K)

K2 - shows creativity and the openness in a team collaboration (K1_K03, K1_K08, Med_K)

K3 - acts in accordance with the principles of ethics, shows respect for the environment and recognizes the risks associated with the use of reagents which may adversely affect the environment and complies with health and safety regulations (K1_K06, K1_K07, Med_K)

K4 - shows attention to the use of so called good laboratory practice in clinical cytogenetic (K1_K06)

Course/module:
METHODS OF HUMAN MOLECULAR DIAGNOSTICS
Fields of education: natural sciences
Course status: Compulsory
Course group: CF-
ECTS code: 13113-112-CF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: III/6

Type of course:laboratory classes, recitation classes
Number of hours per semester/week:
Classes: 45/5
Teaching forms and methods
Classes
Recitation classes - auditorium (W1, W2, W3, W4, U3, K1, K2)
Laboratory classes - laboratory (W1, W2, W3, W4, W5, W6, U1, U2, U3, U4, U5, U6, K1, K2, K3, K4)
Written examination (structured questions) - The evaluation of the written examination. (W1, W2, W3, W4, W5, W6, U1, U2, U4, U5, U6, K1, K3, K4)
Written test 1 - The evaluation of the written test. (W1, W2, W3, W4, W5, W6, U1, U2, U4, U5, U6, K1, K3, K4)
Presentation 1 (presentation analysis of literature, multimedia presentation, oral presentation) - The evaluation of the presentation. (W1, W2, W3, W4, W5, W6, U1, U3, K1, K2, K4)
Report 1 - The evaluation of the written report. (W1, W2, W3, W4, W5, W6, U1, U2, U3, U4, U5, U6, K1, K2, K3, K4)
Form and conditions of obtaining credit:
Examination
Number of ECTS points: 4,5
Language of instruction: English
Introductory courses: Genetics, Methods of Molecular Detection
Preliminary requirements: no

Name of the organizational unit offering the course:
Katedra Fizjologii Zwierząt
Address: ul. Michała Oczapowskiego 1A, pok. 223, 10-719 Olsztyn
tel. 523-32-01, fax 523-39-37
Person in charge of the course:
dr Nina Magdalena Smolińska
Course coordinators:
prof. dr hab. Alicja Lidia Boroń, prof.zw., dr Olga Jabłońska, dr inż. Lech Przemysław Kirtiklis, dr Nina Magdalena Smolińska

Classes conducted in small groups (maximum 12 people).

BASIC LITERATURE

1) Jack J. Pasternak, 2005r., ""An Introduction to Human Molecular Genetics: Mechanisms of Inherited Diseases"", wyd. Wiley, t.2nd Edition, 2) Elles, R. (Ed.), 2004r., ""Molecular Diagnosis of Genetic Diseases"", wyd. Springer; Methods in Molekular Medicine, t.2nd Edition, 3) Epstein R.J., 2002r., ""Human Molecular Biology"", wyd. Cambridge University Press, 4) Fausto, N.; Kaul, K. L., 1999r., ""Presenting the Journal of Molecular Diagnostics"", wyd. The Journal of Molecular Diagnostics, t.1, 5) Grody, Wayne W; Nakamura, Robert M; Strom, Charles M; Kiechle, Frederick L., 2010r., ""Molecular Diagnostics: Techniques and Applications for the Clinical Laboratory"", wyd. Boston MA: Academic Press Inc., 6) Budowle, B.; van Daal, A., 2009r., ""Extracting evidence from forensic DNA analyses: future molecular biology directions"", wyd. Biotechniques, t.46, s.339-350.

SUPPLEMENTARY LITERATURE

1) Minamoto, T.; Ougolkov, A. V.; Mai, M. , 2002r., ""Detection of oncogenes in the diagnosis of cancers with active oncogenic signaling"", wyd. Expert Review of Molecular Diagnostics, t.2, s.565–575, 2) Poste, G. , 2001r., ""Molecular diagnostics: A powerful new component of the healthcare value chain"", wyd. Expert Review of Molecular Diagnostics, t.1, s. 1-5, 3) John Beilby, 2006r., ""Diagnostic Molecular Biology"", wyd. Clin Biochem Rev, t.27.

Detailed description of the awarded ECTS points - part B

METHODS OF HUMAN MOLECULAR DIAGNOSTICS

ECTS: 4,5 **METHODS OF HUMAN MOLECULAR DIAGNOSTICS**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultation		2,0 h
- Participation in classes		45,0 h
	TOTAL:	47,0 h

2. Student's independent work:

- preparation to examination		20,0 h
- reports preparation		15,0 h
- seminar preparation		10,0 h
	TOTAL:	45,0 h
	contact hours + student's independent work COMBINED TOTAL:	92,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 20,00h of the average student's work,

number of ECTS points = 92,00 h: 20,00 h/ECTS = **4,60 ECTS**

on average **4,5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,30** ECTS points (2,35 z 4,6),
- including the number of ECTS points for hours completed in the form of the student's independent work - **2,20** ECTS points (2,25 z 4,6).

Number of ECTS for hours in practical classes - **0,00**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-CF METODY DETEKCJI MOLEKULARNEJ

ECTS:7,5 METHODS OF MOLECULAR DETECTION

COURSE CONTENT

LECTURES

The regulation of replication, transcription and translation. Ways of collecting biological material. The methods of nucleic acids isolation. Methods for quantitative and qualitative analysis of nucleic acids, nucleic acid recovery method from gel. Composition, stages and types of optimization of polymerase chain reaction (PCR). Characteristics of real time PCR reaction (principles, types, advantages and disadvantages, methods of analysis results). Principles of good design primers and probes for real time PCR reaction. Nucleic acid hybridization. Types of hybridization probes and methods of marking. Characteristics of the methods of hybridization (dot- blot, Southern, Northern, Western Blotting). Microarray technique (technology, data analysis, application, advantages and disadvantages. Characteristics of the antibodies used in the immunodetection. Methods for labeling and detection of antibodies. Determination of protein localization using immunocyto/ immunohistochemistry. ELISA.

CLASSES

Isolation of nucleic acids (RNA, DNA) from animal tissues. Determination of the amount of (spectrophotometric measurement) and quality (spectrophotometric measurement, electrophoresis) derived nucleic acids. Designing primers and probes for PCR or real time PCR. Analysis of target gene expression using real time PCR method. Preparation and evaluation of tissue morphology by in situ hybridization (ISH). Staining of tissue sections animal. Determine the cellular localization of the transcript using ISH and densitometric analysis of its quantity. Isolation of proteins from animal tissues, their elektrophoresis and immunodetection by Western Blotting. Densitometric analysis of the concentration of protein using the computer program GelScan. Determination of protein localization using immunocytochemistry/immunohistochemistry. ELISA - enzyme linked immunosorbent assay.

EDUCATIONAL OBJECTIVE

Knowledge of research methods of molecular biology used in genetic and proteomic studies. The ability to select and apply known methods of molecular biology and the ability of the proper interpretation of the results. Ability to use online databases and scientific literature to describe and refere issues of molecular biology.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01+, P1A_W04++, P1A_W05+, P1A_W06++, P1A_W07+, P1A_W08+, P1A_W09+, P1A_W10+, P1A_U01+++, P1A_U02+, P1A_U03++, P1A_U06+++, P1A_U07+++, P1A_U08++, P1A_U09+, P1A_U10++, P1A_K02+, P1A_K03+, P1A_K04+, P1A_K05+, P1A_K06+, P1A_K07+

Codes of learning outcomes in a major area of study K1_W06+, K1_W31+, K1_W32+, K1_W33+, K1_W34+, K1_U03+, K1_U04+, K1_U05+, K1_U07+, K1_U08+, K1_U12+, K1_U13+, K1_U15+, K1_U18+, K1_K03+, K1_K05+, K1_K06+, K1_K07+

LEARNING OUTCOMES

Knowledge

W1 - The student understands the molecular basis of the functioning of eukaryotic organisms (K1_W06)

W2 - The student defines and describes the known methods of molecular biology (K1_W32)

W3 - The student choses properly known methods of research in the field of molecular biology in order to conduct biological experiments (K1_W33)

W4 - The student selects the appropriate tools for the analysis of the results (K1_W31)

W5 - The student knows the rules of working with biological material and ethical issues in biological research (K1_W34)

Skills

U1 - The student uses a variety of techniques / tools research and supports equipment used in molecular biology (K1_U04, K1_U05, K1_U08)

U2 - The student uses of publicly available biological databases (K1_U12)

U3 - The student is able to plan and carry out simple experiments using known methods of molecular biology (K1_U03, K1_U07)

U4 - The student usea their knowledge in the analysis and formulation of conclusions for the conducted experiments, clearly demonstrates the results their own and literature (K1_U13, K1_U15, K1_U18)

Social competence

K1 - The student acts in accordance with ethical rules (K1_K07)

K2 - The student demonstrates a willingness to work in a group (K1_K03)

K3 - The student is aware of the need to increase knowledge, become familiar with scientific journals and internet resources related to biology / molecular biology (K1_K05, K1_K06)

BASIC LITERATURE

1) Burton E. Tropp, 2011r., "Molecular biology: Genes to proteins.", 2) Jeffrey E. Gerst , 2011r., "RNA Detection and Visualization: Methods and Protocols (Methods in Molecular Biology)", 3) different authors, "scientific articles and popular science".

SUPPLEMENTARY LITERATURE

1) Nick A. Saunders and Martin A. Lee, 2013r., "Real-Time PCR: Advanced Technologies and Applications", 2) Ausubel F. , 2002r., "Short protocols in molecular biology.", wyd. ISBN, 3) Sambrook J. & Russel D, 2001r., "Molecular clonning", wyd. ISBN.

Course/module:
METHODS OF MOLECULAR DETECTION
Fields of education: natural sciences
Course status: Compulsory
Course group: CF-
ECTS code: 13113-112-CF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: II/4

Type of course:lecture, laboratory classes, computer-aided classes, recitation classes
Number of hours per semester/week:
Lectures: 30/2
Classes: 60/4
Teaching forms and methods
Lectures
Lecture - informative with multimedia presentation (W1, W2, W3, W4, W5, K1, K3)
Classes
Recitation classes - auditorium (W1, U2, U4, K1, K2, K3)
Computer-aided classes - computer (W3, U2, K1, K2)
Laboratory classes - laboratory (W2, W4, W5, U1, U3, U4, K1, K2, K3)
Written examination (structured questions) - evaluation of the written exam of learning outcomes acquired during lectures and classes (W1, W2, W3, W4, W5)
Written test 1 - evaluation of the written tests (W1, W4, W5)
Presentation 1 - evaluation of the presentation of the course issues (U4, K3)
Report 1 - evaluation of the written report on laboratory classes with the interpretation of results (W2, W3, W4, W5, U1, U2, U3, U4, K1, K2, K3)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 7,5
Language of instruction: English
Introductory courses: genetics, biochemistry, human physiology
Preliminary requirements: none

Name of the organizational unit offering the course:
Katedra Fizjologii Zwierząt
Address: ul. Michała Oczapowskiego 1A, pok. 223, 10-719 Olsztyn
tel. 523-32-01, fax 523-39-37
Person in charge of the course:
dr hab. Iwona Urszula Bogacka, prof. UWM
Course coordinators:
dr hab. Iwona Urszula Bogacka, prof. UWM, dr Nina Magdalena Smolińska

max 12 people in one group

Detailed description of the awarded ECTS points - part B

METODY DETEKCJI MOLEKULARNEJ

ECTS: 7,5 **METHODS OF MOLECULAR DETECTION**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- consultation		2,0 h
- Participation in lectures		30,0 h
- Participation in classes		60,0 h
	TOTAL:	92,0 h

2. Student's independent work:

- prepare for exam		36,0 h
- prepare for writting tests		30,0 h
- prepare for classes		30,0 h
	TOTAL:	96,0 h
	contact hours + student's independent work COMBINED TOTAL:	188,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 188,00 h: 25,00 h/ECTS = **7,52 ECTS**

on average **7,5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **3,67** ECTS points (3,68 z 7,52),
- including the number of ECTS points for hours completed in the form of the student's independent work - **3,83** ECTS points (3,84 z 7,52).

Number of ECTS for hours in practical classes - **1,60**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-C PODSTAWY ENZYMOLOGII

ECTS:2 BASIS OF ENZYMOLOGY

COURSE CONTENT

LECTURES

The specificity of the enzyme activity. the indicator enzymes and their diagnostic significance. Enzymopathology. Isoenzyme phenomenon and its diagnostic use. The mechanism of activation and inhibition of the activity on the example of selected enzymes. Enzyme inhibitors. The use of knowledge about the structure and properties of enzymes in drug design.

CLASSES

Rules of organization and equipment of enzymatic laboratory. Collection and storage of research material. Methods used in enzymology. Sources of errors-errors before analysis, and the resulting analytical procedure, compounds interfering-drugs. Determination of the activity of selected enzymes indicative of serum. Standards activity in the metabolism of enzymes.Cells and extracellular enzymes.

EDUCATIONAL OBJECTIVE

Understanding and practical application of knowledge of enzymology for the evaluation of chemical processes occurring in a living organism in norm and pathology

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01++, P1A_W02+, P1A_W04+++, P1A_W05+++, P1A_W06++, P1A_W07++, P1A_W08+, P1A_W09+, P1A_W10+, P1A_U01+++, P1A_U02+++, P1A_U03++, P1A_U06++, P1A_U07+++, P1A_U08++, P1A_U09+, P1A_U10+, P1A_U11+, P1A_K01+, P1A_K02+, P1A_K03+, P1A_K05++, P1A_K06+

Codes of learning outcomes in a major area of study K1_W06++, K1_W07++, K1_W09+, K1_W28+, K1_W31+, K1_W32+, K1_W33+, K1_W34+, K1_W37+, K1_W38+, K1_U04++, K1_U05+, K1_U07+, K1_U08+, K1_U10+, K1_U11+, K1_U12+, K1_U13+, K1_U16+, K1_U18+, K1_K01+, K1_K03+, K1_K04+, K1_K06+

LEARNING OUTCOMES

Knowledge

W1 - Have knowledge of enzymology, describes the structure of enzymes, able to associate them with the function. Defines and describes biocatalysis in the various biological systems (K1_W06, K1_W07, K1_W09)

W2 - Knows the mechanisms of regulation of metabolism. The ability to define and characterize biochemical reactions and standards capable of pathology associated with a lack of or an insufficient activity of the enzyme (K1_W06, K1_W07, K1_W32)

W3 - Selects appropriate methods for biochemical studies and analyzes and interprets the results. It can be presented in English (K1_W28, K1_W31, K1_W33, K1_W34, K1_W37, K1_W38)

Skills

U1 - Can use basic enzymatic techniques. Able to perform quantitative and qualitative analysis (K1_U04, K1_U05)

U2 - It has the ability to use research equipment (K1_U08)

U3 - Can do simple research commissioned by the assistant (K1_U04)

U4 - Can safely work with biological material with care (K1_U07)

U5 - Demonstrates the ability to analyze the results and draw conclusions based on the scientific literature (K1_U10, K1_U11, K1_U12, K1_U13, K1_U16, K1_U18)

Social competence

K1 - Demonstrates a willingness to use scientific language in discussions with experts from related fields (K1_K01)

K2 - Able to work in a team, taking a variety of roles and define piorities (K1_K03, K1_K06)

K3 - Is aware of the constant updating of knowledge in biochemistry and enzymology (K1_K04)

BASIC LITERATURE

1) P. Jeanteur, 2011r., "Molecular and Cellular enzymology", wyd. Springer, 2) Jeanine Yon-Kahn-Guy Herve, 2010r., "Molecular and Cellular enzymology", wyd. Springer, t.1, 3) Allan Gaw, M. J. Murphy, R. A. Cowan, D. St J. O'Reilly, M. J. Stweart, J. Shepherd, 2010r., "Clinical biochemistry", wyd. Churchill livingstone, 4) J.M.Berg, J.L.Tymoczko, L. Stryer, 2002r., "Biochemistry", wyd. W.H.Freeman.

SUPPLEMENTARY LITERATURE

1) R.H. Glew, Yoshifumi Ninomiya, 1997r., "Clinical studies in medical biochemistry", wyd. Oxford, 2) W. J.Elliott, D. C. Elliott, 2009r., "Biochemistry and molecular biology", wyd. Oxford, 3) Martin A. Crook, 2012r., "Clinical biochemistry and metabolic medicine", wyd. Hooder Arnold, 4) T.M. Devlin, 1995r., "Textbook of biochemistry with clinical correlation", wyd. Wiley, 5) Different authors, "Scientific articles and popular science in the field of object".

Course/module:
BASIS OF ENZYMOLOGY
Fields of education: medical sciences, health sciences and physical culture studies
Course status: Compulsory
Course group: C-specialty course
ECTS code: 13113-112-C
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: II/4

Type of course:practical courses, lecture
Number of hours per semester/week:
Lectures: 10/2
Classes: 20/4
Teaching forms and methods
Lectures
Lecture - Informative lectures with a multimedia presentation (W1, W2, K1, K3)
Classes
Practical courses - laboratory classes (W2, W3, U1, U2, U3, U4, U5, K1, K2, K3)
Written test 2 - descriptive questions, tasks biochemical skill of interpretation, enzymatic diagnostics (W2, W3, U5, K3)
Written test 1 - test with multiple choice, open and closed questions (W1, W2, K1, K3)
Report 1 - report, biochemical methods, the development of performance, compatibility with an attempt to reference skill of analysis and interpretation of the results (W3, U1, U2, U3, U4, U5, K2)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 2
Language of instruction: English
Introductory courses: biochemistry
Preliminary requirements: no indications

Name of the organizational unit offering the course:
Katedra Biochemii
Address: ul. Michała Oczapowskiego 1A, pok. 316, 10-719 Olsztyn
tel. 523-39-90, 523-48-83, tel./fax 535-20-15
Person in charge of the course:
dr Elżbieta Łopieńska-Biernat
e-mail: ela.lopienska@uwm.edu.pl
Course coordinators:
dr Elżbieta Łopieńska-Biernat

Detailed description of the awarded ECTS points - part B

PODSTAWY ENZYMOLOGII

ECTS: 2 BASIS OF ENZYMOLOGY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:		
- consultation		1,0 h
- Participation in lectures		10,0 h
- Participation in classes		20,0 h
	TOTAL:	31,0 h
2. Student's independent work:		
- prepare to testes		15,0 h
- prepare to exercises		5,0 h
- prepare reports		5,0 h
	TOTAL:	25,0 h
	contact hours + student's independent work COMBINED TOTAL:	56,0h
Practical classes:		
- practical classes		20,0 h
		20,0 h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 56,00 h: 25,00 h/ECTS = **2,24 ECTS**

on average **2 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **1,11** ECTS points (1,24 z 2,24),
- including the number of ECTS points for hours completed in the form of the student's independent work - **0,89** ECTS points (1,00 z 2,24).

Number of ECTS for hours in practical classes - **0,00**

Number of ECTS for hours in practical classes - **1,00**

Number of ECTS for hours in professional practice - **0,50**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-C PODSTAWY ENZYMOLOGII

ECTS:2 BASIS OF ENZYMOLOGY

COURSE CONTENT

LECTURES

The specificity of the enzyme activity. the indicator enzymes and their diagnostic significance. Enzymopathology. Isoenzyme phenomenon and its diagnostic use. The mechanism of activation and inhibition of the activity on the example of selected enzymes. Enzyme inhibitors. The use of knowledge about the structure and properties of enzymes in drug design.

CLASSES

Rules of organization and equipment of enzymatic laboratory. Collection and storage of research material. Methods used in enzymology. Sources of errors-errors before analysis, and the resulting analytical procedure, compounds interfering-drugs. Determination of the activity of selected enzymes indicative of serum. Standards activity in the metabolism of enzymes.Cells and extracellular enzymes.

EDUCATIONAL OBJECTIVE

Understanding and practical application of knowledge of enzymology for the evaluation of chemical processes occurring in a living organism in norm and pathology

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W01++, P1A_W02+, P1A_W04+++, P1A_W05+++, P1A_W06++, P1A_W07++, P1A_W08+, P1A_W09+, P1A_W10+, P1A_U01+++, P1A_U02+++, P1A_U03++, P1A_U06++, P1A_U07+++, P1A_U08++, P1A_U09+, P1A_U10+, P1A_U11+, P1A_K01+, P1A_K02+, P1A_K03+, P1A_K05++, P1A_K06+

Codes of learning outcomes in a major area of study K1_W06++, K1_W07++, K1_W09+, K1_W28+, K1_W31+, K1_W32+, K1_W33+, K1_W34+, K1_W37+, K1_W38+, K1_U04++, K1_U05+, K1_U07+, K1_U08+, K1_U10+, K1_U11+, K1_U12+, K1_U13+, K1_U16+, K1_U18+, K1_K01+, K1_K03+, K1_K04+, K1_K06+

LEARNING OUTCOMES

Knowledge

W1 - Have knowledge of enzymology, describes the structure of enzymes, able to associate them with the function. Defines and describes biocatalysis in the various biological systems (K1_W06, K1_W07, K1_W09)

W2 - Knows the mechanisms of regulation of metabolism. The ability to define and characterize biochemical reactions and standards capable of pathology associated with a lack of or an insufficient activity of the enzyme (K1_W06, K1_W07, K1_W32)

W3 - Selects appropriate methods for biochemical studies and analyzes and interprets the results. It can be presented in English (K1_W28, K1_W31, K1_W33, K1_W34, K1_W37, K1_W38)

Skills

U1 - Can use basic enzymatic techniques. Able to perform quantitative and qualitative analysis (K1_U04, K1_U05)

U2 - It has the ability to use research equipment (K1_U08)

U3 - Can do simple research commissioned by the assistant (K1_U04)

U4 - Can safely work with biological material with care (K1_U07)

U5 - Demonstrates the ability to analyze the results and draw conclusions based on the scientific literature (K1_U10, K1_U11, K1_U12, K1_U13, K1_U16, K1_U18)

Social competence

K1 - Demonstrates a willingness to use scientific language in discussions with experts from related fields (K1_K01)

K2 - Able to work in a team, taking a variety of roles and define piorities (K1_K03, K1_K06)

K3 - Is aware of the constant updating of knowledge in biochemistry and enzymology (K1_K04)

BASIC LITERATURE

1) P. Jeanteur, 2011r., "Molecular and Cellular enzymology", wyd. Springer, 2) Jeanine Yon-Kahn-Guy Herve, 2010r., "Molecular and Cellular enzymology", wyd. Springer, t.1, 3) Allan Gaw, M. J. Murphy, R. A. Cowan, D. St J. O'Reilly, M. J. Stweart, J. Shepherd, 2010r., "Clinical biochemistry", wyd. Churchill livingstone, 4) J.M.Berg, J.L.Tymoczko, L. Stryer, 2002r., "Biochemistry", wyd. W.H.Freeman.

SUPPLEMENTARY LITERATURE

1) R.H. Glew, Yoshifumi Ninomiya, 1997r., "Clinical studies in medical biochemistry", wyd. Oxford, 2) W. J.Elliott, D. C. Elliott, 2009r., "Biochemistry and molecular biology", wyd. Oxford, 3) Martin A. Crook, 2012r., "Clinical biochemistry and metabolic medicine", wyd. Hooder Arnold, 4) T.M. Devlin, 1995r., "Textbook of biochemistry with clinical correlation", wyd. Wiley, 5) Different authors, "Scientific articles and popular science in the field of object".

Course/module:
BASIS OF ENZYMOLOGY
Fields of education: medical sciences, health sciences and physical culture studies
Course status: Compulsory
Course group: C-specialty course
ECTS code: 13113-112-C
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: II/4

Type of course:practical courses, lecture
Number of hours per semester/week:
Lectures: 10/2
Classes: 20/4
Teaching forms and methods
Lectures
Lecture - Informative lectures with a multimedia presentation (W1, W2, K1, K3)
Classes
Practical courses - laboratory classes (W2, W3, U1, U2, U3, U4, U5, K1, K2, K3)
Written test 2 - descriptive questions, tasks biochemical skill of interpretation, enzymatic diagnostics (W2, W3, U5, K3)
Written test 1 - test with multiple choice, open and closed questions (W1, W2, K1, K3)
Report 1 - report, biochemical methods, the development of performance, compatibility with an attempt to reference skill of analysis and interpretation of the results (W3, U1, U2, U3, U4, U5, K2)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 2
Language of instruction: English
Introductory courses: biochemistry
Preliminary requirements: no indications

Name of the organizational unit offering the course:
Katedra Biochemii
Address: ul. Michała Oczapowskiego 1A, pok. 316, 10-719 Olsztyn
tel. 523-39-90, 523-48-83, tel./fax 535-20-15
Person in charge of the course:
dr Elżbieta Łopieńska-Biernat
e-mail: ela.lopienska@uwm.edu.pl
Course coordinators:
dr Elżbieta Łopieńska-Biernat

Detailed description of the awarded ECTS points - part B

PODSTAWY ENZYMOLOGII

ECTS: 2 BASIS OF ENZYMOLOGY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:		
- consultation		1,0 h
- Participation in lectures		10,0 h
- Participation in classes		20,0 h
	TOTAL:	31,0 h
2. Student's independent work:		
- prepare to testes		15,0 h
- prepare to exercises		5,0 h
- prepare reports		5,0 h
	TOTAL:	25,0 h
	contact hours + student's independent work COMBINED TOTAL:	56,0h
Practical classes:		
- practical classes		20,0 h
		20,0 h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 56,00 h: 25,00 h/ECTS = **2,24 ECTS**

on average **2 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **1,11** ECTS points (1,24 z 2,24),
- including the number of ECTS points for hours completed in the form of the student's independent work - **0,89** ECTS points (1,00 z 2,24).

Number of ECTS for hours in practical classes - **0,00**

Number of ECTS for hours in practical classes - **1,00**

Number of ECTS for hours in professional practice - **0,50**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-CF WPROWADZENIE DO BIOTECHNOLOGII MEDYCZNEJ

ECTS:1,5 INTRODUCTION TO THE MEDICAL BIOTECHNOLOGY

COURSE CONTENT

LECTURES

Basic techniques used in biotechnology; transgenesis; animal cloning; xenotransplantation; therapeutic cloning; utilization of stem cells in biotechnology; rudiments of tissue engineering; therapeutic use of RNA-RNA interference; production of drugs and diagnostic factors on the basis of biotechnological methods; application of biotechnology, including nanotechnology, for medicine and pharmacology; controversies related to some aspects of biotechnology

EDUCATIONAL OBJECTIVE

Getting to know the basic techniques, successes and risks of biotechnology and the possibilities of using biotechnological products in various fields of economy, science and medicine

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W04++, P1A_W05+, P1A_W07+, P1A_W08+, P1A_U02++, P1A_U07+, P1A_U08+, P1A_U11+, P1A_K01++, P1A_K04+, P1A_K05++, P1A_K07+, M1_W01+, M1_K01+

Codes of learning outcomes in a major area of study K1_W12+, K1_W27+, Med_W+, K1_U10+, K1_U11+, K1_U16+, K1_K02+, K1_K04+, K1_K05+, K1_K07+, Med_K+

LEARNING OUTCOMES

Knowledge

W1 - Student is familiar with possibilities of biotechnology utilization for the production of biologically active compounds, in diagnostics, therapy and prophylaxis of diseases (K1_W12, K1_W27, Med_W)

Skills

U1 - Student can in a thoughtful and critical way provide information about the importance and role of biotechnology in the modern world (K1_U10, K1_U11, K1_U16)

Social competence

K1 - Student understands the need for lifelong learning and the development of professional and personal skills (K1_K02, K1_K04, K1_K05, Med_K)

K2 - Student understands of importance of ethical conduct concerning biological material (K1_K07)

BASIC LITERATURE

1) Buchowicz J, 2007r., "Biotechnologia molekularna. Geneza, przedmiot, perspektywy badań", wyd. PWN, 2) Ratledge C., Kristiansen B., 2011r., "Podstawy biotechnologii", wyd. PWN.

SUPPLEMENTARY LITERATURE

Brak

Course/module:
INTRODUCTION TO THE MEDICAL BIOTECHNOLOGY
Fields of education: natural sciences, medical sciences, health sciences and physical culture studies
Course status: Optional
Course group: CF-
ECTS code: 13113-112-CF
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: III/6

Type of course:lecture
Number of hours per semester/week:
Lectures: 20/2
Teaching forms and methods
Lectures
Lecture - multimedia lectures (W1, U1, K1, K2)
Written test 1 - evaluation of the written test (W1, U1, K1, K2)
Form and conditions of obtaining credit:
Graded credit
Number of ECTS points: 1,5
Language of instruction: English
Introductory courses: methods of in vitro cultures, human physiology, biochemistry, genetics
Preliminary requirements: Basic knowledge of methods of in vitro cultures, human physiology, biochemistry, genetics

Name of the organizational unit offering the course:
Katedra Fizjologii Zwierząt
Address: ul. Michała Oczapowskiego 1A, pok. 223, 10-719 Olsztyn
tel. 523-32-01, fax 523-39-37
Person in charge of the course:
prof. dr hab. Tadeusz Szczepan Kamiński
Course coordinators:
prof. dr hab. Tadeusz Szczepan Kamiński

none

Detailed description of the awarded ECTS points - part B

WPROWADZENIE DO BIOTECHNOLOGII MEDYCZNEJ

ECTS: 1,5 **INTRODUCTION TO THE MEDICAL BIOTECHNOLOGY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:		
- consultations		1,0 h
- Participation in lectures		20,0 h
	TOTAL:	21,0 h
2. Student's independent work:		
- preparation for written test		15,0 h
	TOTAL:	15,0 h
	contact hours + student's independent work COMBINED TOTAL:	36,0h
Practical classes:		
- practical classes		h
		h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 36,00 h: 25,00 h/ECTS = **1,44 ECTS**

on average **1,5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **0,88** ECTS points (0,84 z 1,44),
- including the number of ECTS points for hours completed in the form of the student's independent work - **0,63** ECTS points (0,60 z 1,44).

Number of ECTS for hours in practical classes - **0,00**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

The Faculty of Biology and Biotechnology

Course/module syllabus - part A

13113-112-C ZOOLOGIA

ECTS:4 ZOOLOGY

COURSE CONTENT

LECTURES

Functional morphology of animals of different body structure: single-celled and multicellular Metazoa Protozoa, Diblastica and Triblastica, Protostomia and Deuterostomia. Embryonic development as a property of metazoan life. Primary and secondary body cavity - the characteristics and features, benefits and limitations. Characteristic features of systematic major groups of animals. Integument of invertebrates and vertebrates, structure and functions. External and internal skeleton animals, the muscular system - examples and features. The nervous system and sensory organs selected invertebrates and vertebrates. Overview of structures for internal transport and structures for gas exchange in the air and in the water. Eating habits of animal based on selected examples, the construction of the digestive system of animals. Osmoregulation and excretion in invertebrates and vertebrates. Asexual reproduction, sexual and unisexual animals.

CLASSES

Functional morphology of Protozoa - Ciliata ciliates and Metazoa - multicellular animals; Porifera, Eumetazoa: Diblastica and Triblastica: Acoelomata - flatworms, Pseudocoelomata - nematodes and Coelomata; Annelida annelids, arthropods. Comparison of primary and secondary body cavity. The functional morphology of arthropod; crustaceans, Uniramia - insects and Myriapoda, Mollusca. Chordata: Cephalochordata, jawless vertebrates - primitive - river lamprey. Comparison of clusters of rayfinned fish Actinopterygii and Chondrichthyes cartilaginous fish. Functional morphology of Amphibia amphibians and reptiles Reptilia and endotermic verebrates - Aves, Mammalia.

EDUCATIONAL OBJECTIVE

Introduce students with the construction and functioning of animal organisms, developing skills for comparative analysis of functional morphology of selected taxa of invertebrates and vertebrates. Understanding the features of systematic and phylogenetic relationships of the major groups of animals Animalia.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W04++, P1A_W05++, P1A_U01+, P1A_U02+, P1A_U03+, P1A_U06+, P1A_U07+, P1A_K04+, P1A_K05+, P1A_K07+

Codes of learning outcomes in a major area of study K1_W15+, K1_W16+, K1_U03+, K1_U12+, K1_K05+, K1_K07+

LEARNING OUTCOMES

Knowledge

W1 - lists and characterizes the individual taxa of invertebrates and vertebrate (K1_W15)

W2 - names and explains the characteristics of the construction and functioning of animal organisms (K1_W16)

Skills

U1 - characterize the functional morphology of the basic groups of animals - their functioning and structure of systems and organs (K1_U03)

U2 - indicates the specific characteristics of the major taxonomic groups of animals (K1_U12)

Social competence

K1 - behaves in accordance with accepted principles of ethics to the wild and laboratory animals (K1_K07)

K2 - is aware of the dynamic development in biological research (K1_K05)

BASIC LITERATURE

1) Karel F. Liem, Warren Franklin Walker , 2001r., "Functional anatomy of the vertebrates: an evolutionary perspective", wyd. Harcourt College Publishers, t.1, s.703, 2) Richard C. Brusca, Gary J. Brusca, N. J. Haver , 203r., "Invertebrates 2nd edition", wyd. Sinauer Associates; 2 edition , t.1, s.936.

SUPPLEMENTARY LITERATURE

1) Brylińska M., 2000r., "Ryby słodkowodne Polski", wyd. Naukowe PWN, Warszawa.

Course/module:
ZOOLOGY
Fields of education: natural sciences
Course status: Compulsory
Course group: C-specialty course
ECTS code: 13113-112-C
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/1

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 20/2
Classes: 35/3
Teaching forms and methods
Lectures
Lecture - lecture and multimedia presentation (W1, W2, U1, U2, K1, K2)
Classes
Laboratory classes - Exercises in the diagnosis of selected taxa of invertebrates and vertebrate (U1, U2, K1, K2)
Written examination (yes/no questions test, structured questions) - written exam test and / or requiring short written answers (W1, W2)
Written test 1 - two written tests of the contents training (U1, U2, K1, K2)
Written test 2 - second written test (U1, U2, K1, K2)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 4
Language of instruction: English
Introductory courses: lack
Preliminary requirements: lack

Name of the organizational unit offering the course:
Katedra Zoologii
Address: ul. Michała Oczapowskiego 5, pok. 261, 10-718 Olsztyn
tel./fax 523-32-61
Person in charge of the course:
prof. dr hab. Alicja Lidia Boroń, prof.zw.
e-mail: alibo@uwm.edu.pl
Course coordinators:
prof. dr hab. Alicja Lidia Boroń, prof.zw., dr Iwona Jeleń, dr Dorota Juchno, dr inż. Jolanta Barbara Szlachciak

Detailed description of the awarded ECTS points - part B

ZOOLOGIA

ECTS: 4 **ZOOLOGY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- Participation in lectures		20,0 h
- Participation in classes		35,0 h
	TOTAL:	55,0 h

2. Student's independent work:

- the development of the reports of the exercises		10,0 h
- prepare for the exam		20,0 h
- preparation for colloquia		20,0 h
	TOTAL:	50,0 h
	contact hours + student's independent work COMBINED TOTAL:	105,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 105,00 h: 25,00 h/ECTS = **4,20 ECTS**

on average **4 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,10** ECTS points (2,20 z 4,2),
- including the number of ECTS points for hours completed in the form of the student's independent work - **1,90** ECTS points (2,00 z 4,2).

Number of ECTS for hours in practical classes - **1,80**

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN
The Faculty of Biology and Biotechnology
Course/module syllabus - part A

13113-112-C ZOOLOGIA

ECTS:4 ZOOLOGY

COURSE CONTENT

LECTURES

Functional morphology of animals of different body structure: single-celled and multicellular Metazoa Protozoa, Diblastica and Triblastica, Protostomia and Deuterostomia. Embryonic development as a property of metazoan life. Primary and secondary body cavity - the characteristics and features, benefits and limitations. Characteristic features of systematic major groups of animals. Integument of invertebrates and vertebrates, structure and functions. External and internal skeleton animals, the muscular system - examples and features. The nervous system and sensory organs selected invertebrates and vertebrates. Overview of structures for internal transport and structures for gas exchange in the air and in the water. Eating habits of animal based on selected examples, the construction of the digestive system of animals. Osmoregulation and excretion in invertebrates and vertebrates. Asexual reproduction, sexual and unisexual animals.

CLASSES

Functional morphology of Protozoa - Ciliata ciliates and Metazoa - multicellular animals; Porifera, Eumetazoa: Diblastica and Triblastica: Acoelomata - flatworms, Pseudocoelomata - nematodes and Coelomata; Annelida annelids, arthropods. Comparison of primary and secondary body cavity. The functional morphology of arthropod; crustaceans, Uniramia - insects and Myriapoda, Mollusca. Chordata: Cephalochordata, jawless vertebrates - primitive - river lamprey. Comparison of clusters of rayfinned fish Actinopterygii and Chondrichthyes cartilaginous fish. Functional morphology of Amphibia amphibians and reptiles Reptilia and endotermic verebrates - Aves, Mammalia.

EDUCATIONAL OBJECTIVE

Introduce students with the construction and functioning of animal organisms, developing skills for comparative analysis of functional morphology of selected taxa of invertebrates and vertebrates. Understanding the features of systematic and phylogenetic relationships of the major groups of animals Animalia.

DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study P1A_W04++, P1A_W05++, P1A_U01+, P1A_U02+, P1A_U03+, P1A_U06+, P1A_U07+, P1A_K04+, P1A_K05+, P1A_K07+

Codes of learning outcomes in a major area of study K1_W15+, K1_W16+, K1_U03+, K1_U12+, K1_K05+, K1_K07+

LEARNING OUTCOMES

Knowledge

W1 - lists and characterizes the individual taxa of invertebrates and vertebrate (K1_W15)

W2 - names and explains the characteristics of the construction and functioning of animal organisms (K1_W16)

Skills

U1 - characterize the functional morphology of the basic groups of animals - their functioning and structure of systems and organs (K1_U03)

U2 - indicates the specific characteristics of the major taxonomic groups of animals (K1_U12)

Social competence

K1 - behaves in accordance with accepted principles of ethics to the wild and laboratory animals (K1_K07)

K2 - is aware of the dynamic development in biological research (K1_K05)

BASIC LITERATURE

1) Karel F. Liem, Warren Franklin Walker , 2001r., "Functional anatomy of the vertebrates: an evolutionary perspective", wyd. Harcourt College Publishers, t.1, s.703, 2) Richard C. Brusca, Gary J. Brusca, N. J. Haver , 203r., "Invertebrates 2nd edition", wyd. Sinauer Associates; 2 edition , t.1, s.936.

SUPPLEMENTARY LITERATURE

1) Brylińska M., 2000r., "Ryby słodkowodne Polski", wyd. Naukowe PWN, Warszawa, 2) Berger L., 2000r., "Płazy i gady Polski", wyd. Naukowe PWN, Warszawa.

Course/module:
ZOOLOGY
Fields of education: natural sciences
Course status: Compulsory
Course group: C-specialty course
ECTS code: 13113-112-C
Major: Biology
Speciality: Medical Biology
Educational profile: General academic
Form of study: Full-time
Level of study/Form of education: First-cycle studies
Year/semester: I/1

Type of course:laboratory classes, lecture
Number of hours per semester/week:
Lectures: 20/2
Classes: 35/3
Teaching forms and methods
Lectures
Lecture - lecture and multimedia presentation (W1, W2, U1, U2, K1, K2)
Classes
Laboratory classes - Exercises in the diagnosis of selected taxa of invertebrates and vertebrate (U1, U2, K1, K2)
Written examination (yes/no questions test, structured questions) - written exam test and / or requiring short written answers (W1, W2)
Written test 1 - two written tests of the contents training (U1, U2, K1, K2)
Written test 2 - second written test (U1, U2, K1, K2)
Form and conditions of obtaining credit: Examination
Number of ECTS points: 4
Language of instruction: English
Introductory courses: lack
Preliminary requirements: lack

Name of the organizational unit offering the course:
Katedra Zoologii
Address: ul. Michała Oczapowskiego 5, pok. 261, 10-718 Olsztyn
tel./fax 523-32-61
Person in charge of the course:
prof. dr hab. Alicja Lidia Boroń, prof.zw.
e-mail: alibo@uwm.edu.pl
Course coordinators:
prof. dr hab. Alicja Lidia Boroń, prof.zw., dr Iwona Jeleń, dr Dorota Juchno, dr inż. Jolanta Barbara Szlachciak

without comments

Detailed description of the awarded ECTS points - part B

ZOOLOGIA

ECTS: 4 **ZOOLOGY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- Participation in lectures		20,0 h
- Participation in classes		35,0 h
	TOTAL:	55,0 h

2. Student's independent work:

- the development of the reports of the exercises		10,0 h
- prepare for the exam		20,0 h
- preparation for colloquia		20,0 h
	TOTAL:	50,0 h
	contact hours + student's independent work COMBINED TOTAL:	105,0h

Practical classes:

- practical classes	h
	h

1 ECTS point = 25,00h of the average student's work,

number of ECTS points = 105,00 h: 25,00 h/ECTS = **4,20 ECTS**

on average **4 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher - **2,10** ECTS points (2,20 z 4,2),
- including the number of ECTS points for hours completed in the form of the student's independent work - **1,90** ECTS points (2,00 z 4,2).

Number of ECTS for hours in practical classes - **1,80**