UNIWERSYTET IM. ADAMA MICKIEWICZA W POZNANIU

Basic molecular methods

Educational subject description sheet

Basic information

Study programme Environmental Protection **Speciality** - **Organizational unit** Faculty of Biology **Study level** Second-cycle programme **Study form** Full-time **Education profile** General academic	**Didactic cycle** 2024/25 **Subject code** 01EVPS.22N.12959.24 **Lecture languages** English **Course type** Elective **Block** Subjects not assigned

Subject coordinator	Małgorzata Wojtkowska
Lecturer	Małgorzata Wojtkowska, Hanna Kmita, Andonis Karachitos

Period	**Activities and hours**	**Number of ECTS points**
Semester 2	• Lecture: 10, Graded credit • Classes: 20, Graded credit	3

Goals

Code	Goal
C1	Consolidation of knowledge about nucleic acids and proteins, as well as the relationship between them, and transferring knowledge about the basic molecular methods enabling their analysis in the context of environmental research.
C2	Students should interdependently select the basic methods of molecular biology, use them and interpret the results in the context of environmental research.

Subject learning outcomes

Code	Outcomes in terms of	Learning outcomes	Examination methods
Knowledge – Student:			
W1	Presents the basic information on the structure, function of nucleic acids and proteins and their importance in use in the environmental studies.	EVP_K2_W01, EVP_K2_W04	Test, Written work
W2	Characterizes the basic methods of molecular biology for the study of nucleic acids and proteins for environmental purpose.	EVP_K2_W04	Test, Written work
Skills – Student:			
U1	Plans experiment based on nucleic acids for environmental studies.	EVP_K2_U02, EVP_K2_U03, EVP_K2_U09	Report, Written work
U2	Cooperates in group to perform an experiment based on the basic methods of molecular biology, critically analyzes the results and formulate conclusions regarding them.	EVP_K2_U02, EVP_K2_U03, EVP_K2_U08, EVP_K2_U09	Report
Social competences – Student:			
K1	critically evaluates the results of environmental studies based on molecular biology methods	EVP_K2_K01	Report

Study content

No.	Course content	Subject learning outcomes	Activities
1.	Basic information regarding the structure, function and importance of nucleic acids in environmental research.	W1, W2	Lecture
2.	Basic information regarding the structure, function and importance of proteins in environmental research.	W1, W2	Lecture
3.	The use of nucleic acids in environmental research and the methods used for this purpose: cloning, PCR; microarrays, genotyping (SNP and RLFP); Sanger and NGS sequencing.	W2, U1, U2	Lecture, Classes
4.	The use of proteins in environmental research and the methods used for this purpose: protein isolation and purification, electrophoresis, immunodetection and Elisa test, microscopy, mass spectrometry, protein expression in model organisms.	W1, W2, K1	Lecture

Additional information

Activities	Teaching and learning methods and activities
Lecture	Lecture with a multimedia presentation of selected issues
Classes	Laboratory method, Research method (scientific inquiry), Work in groups

Activities	Credit conditions
Lecture	Passing the classes is obligatory and necessary for taking the exam. The grading scale applies: bdb; 5,0: 91-100% +db; 4,5: 81-90% db; 4,0: 71-80% +dst; 3,5: 61-70% dst; 3,0: 51-60% ndst; 2,0: 0-50% failed
Classes	The final grade of the exercises is the average of the following partial grades: - written test (60%), - individual student's work on exercises (report as a summary of the exercise - 40%). The grading scale applies: bdb; 5,0: 91-100% +db; 4,5: 81-90% db; 4,0: 71-80% +dst; 3,5: 61-70% dst; 3,0: 51-60% ndst; 2,0: 0-50% failed

Literature

Obligatory

1. Instant notes. Biochemistry. Fourth edition. B.D. Hames; N.M. Hooper. 2011 Copyright@ Taylor & Francis Group (polish edition PWN Warszawa 2021)

Calculation of ECTS points

Activities	Activity hours*
Lecture	10
Classes	20
Preparation for classes	10
Report preparation	30
Preparation for the exam	20
Student workload	**Hours** 90
Number of ECTS points	**ECTS** 3

* academic hour = 45 minutes

Efekty uczenia się dla kierunku

Kod	Treść
EVP_K2_K01	The graduate is ready to critical assessment of received information on environmental protection as well as formulation of rational judgments on this subject
EVP_K2_U02	The graduate can independently plan and conduct research as well as analyse the correctness of tasks performed and the reliability of the results obtained, and draw conclusions useful in environmental protection
EVP_K2_U03	The graduate can use the tools, methods and research techniques applied in laboratory and field work, especially for monitoring and assessment of the state of the environment
EVP_K2_U08	The graduate can cooperate and work in a group, playing various roles in it
EVP_K2_U09	The graduate can lead a team and coordinate its work
EVP_K2_W01	The graduate knows and understands theories, processes, facts, and objects related to general knowledge about environmental protection and related sciences
EVP_K2_W04	The graduate knows and understands rules of practical use of theoretical knowledge in assessing the condition of terrestial environments and maintaining or restoring them to their proper condition