KAPITAŁ LUDZKI
NARODOWA STRATEGIA SPÓJNOŚCI
Projekt współfinansowany przez Unię Europejską w ramach Europejskiego Funduszu Społecznego
UNIA EUROPEJSKA
EUROPEJSKI FUNDUSZ SPOŁECZNY

Course title	ECTS code
Molecular Biology	13.1.1448

Name of unit administrating study

Faculty of Biology

Studies

faculty	field of study		
Faculty of Biology	Medical Biology	type	first tier studies (BA), second tier studies (MA)
		form	full-time
		specialty	all
		specialization	all
Faculty of Biology	Biology	type	first tier studies (BA), second tier studies (MA)
		form	full-time
		specialty	all
		specialization	all
Faculty of Biology	Genetics and Experimental Biology	type	first tier studies (BA)
		form	full-time
		specialty	all
		specialization	all
Faculty of Biology	Natural Resources Conservation	type	first tier studies (BA)
		form	full-time
		specialty	all
		specialization	all

Teaching staff

prof. dr hab. Grzegorz Węgrzyn; dr hab. Wojciech Pokora, profesor uczelni; dr Bożena Nejman-Faleńczyk, profesor uczelni; dr Karolina Pierzynowska

Forms of classes, the realization and number of hours

Forms of classes

Laboratory classes, Lecture

The realization of activities

classroom instruction, online classes

Number of hours

Lecture: 15 hours, Laboratory classes: 15 hours

ECTS credits

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ESTIMATION OF WORKING TIME
Working in contact with the teacher:
Participation in lectures - 15 hours
Participation in classes - 15 hours
Consultations - 11 hours
The unassisted student work (studying the literature, preparing for the reports, tests and exams): 34 hours
TOTAL: 75 hours

The academic cycle

2022/2023 winter semester

Type of course

an elective course

Language of instruction

english

Teaching methods

- Laboratory excercises
- Lecture
- multimedia-based lecture

Form and method of assessment and basic criteria for eveluation or examination requirements

Final evaluation

- Graded credit
- Examination

Assessment methods

Test, written colloquium, reports from experiments

The basic criteria for evaluation

Knowledge, competences and skills according to the program of the lectures and practical classes

Method of verifying required learning outcomes

Required courses and introductory requirements

A. Formal requirements

Courses in chemistry

B. Prerequisites

Basic knowledge in chemistry, using simple laboratory equipment, preparation of buffers and solutions

Aims of education

Gaining knowledge of the structures and functions of nucleic acids, including replication of genetic material, recombination, repair and mutagenesis, regulation of gene expression. Practical skills in basic molecular biology techniques, planning and conducting experiments using techniques specific for molecular biology and genetic engineering.

Course contents

Lectures: Structures of DNA and RNA. Organization and replication of genetic material in prokaryotic and eukaryotic cells, including chromosomes, plasmids and viral nucleic acids. Gene structure. Stages of gene expression. Regulation of gene expression at various levels, including transcription, post-transcriptional modification, translation, and post-translational modification. Genetic recombination systems. DNA damage, repair and mutagenesis. Principles of genetic engineering.

Practical classes: Basic methods of DNA analysis, including DNA isolation, gel electrophoresis, restriction analysis, PCR-mediated amplification. Analysis of gene expression with the use of gene fusions, estimation of protein levels, and phenotypic expression of genetic information.

Bibliography of literature

A. Literatura wymagana do ostatecznego zaliczenia zajęć (zdania egzaminu):
A.1. Lizabeth Ann Allison. Fundamental Molecular Biology, 3rd ed., Wiley-Blackwell, 2021
A.2. Jocelyn E. Krebs, Elliott S. Goldstein, Stephen T. Kilpatrick. Lewin's Genes XII, Jones and Bartlett Learing, 2021.
B. Literatura uzupełniająca
Sue Carson Heather Miller Melissa Srougi D. Scott Witherow. Molecular Biology Techniques, 4th ed., Elsevier, 2019.

The learning outcomes (for the field of study and specialization)

Knowledge

- describes the structure and properties of basic types of biological macromolecules, molecular mechanisms of the basic metabolism pathways and the flow of genetic information, and sources of variability of organisms;
- defines the most important laws and rules of physics and chemistry underlying biological processes and describes properties of chemical elements and compounds;

Skills

- uses basic research equipment and tools, as well as maintains correct order of activities in the laboratory,
- conducts observations and performs basic physical, biological and chemical measurements in the field or laboratory,

Social competence

- is responsible for safety of their own work and that of others, as well as is able to recognize emergency situations and take appropriate actions,
- is responsible for the entrusted equipment / materials and their own work, and respects the work of others,

Contact

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