

Subject card

Subject name and code	Principles of biology, PG_00158589						
Field of study	Nuclear safety and radiological protection						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2024/2025		
Education level	undergraduate studies		Subject group		Obligatory subject group in the field of study		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	1		Language of instruction		Polish not applicable		
Semester of study	2		ECTS credits		4.0		
Learning profile	academic		Assessment form				
Conducting unit	Pracownia Geobotaniki i Ochrony Przyrody -> Katedra Taksonomii Roślin i Ochrony Przyrody -> Faculty of Biology -> Rektor						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. Piotr Rutkowski				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	60		0.0		30.0	90
Subject objectives	1. to learn the basics of the structure, biology and classification of living organisms.2. to understand the biological processes that determine life at different levels of its organization.- Getting acquainted with the structure of DNA, RNA and protein molecules- getting acquainted with the most common mutagenic agents (including radiation) and the ways they act on nucleic acids.- getting acquainted with the mechanisms of replication, transcription and translation in prokaryotic and eukaryotic cells, and discussing ways to regulate of this process at its various stages.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[BJORL3_W01] has a general knowledge of the basic concepts and principles of nuclear physics and chemistry, understands their historical development and their importance not only for nuclear safety and radiation protection, but also for understanding the modern world; has a basic knowledge of biology and ecology	Graduate: - explains the basic concepts of biology, presents the structure and functional relationships at the cellular, tissue, organ and organismal levels - describes biological phenomena occurring in nature, presents the evolution of selected groups of organisms has basic knowledge of molecular biology, is familiar with basic techniques of molecular biology, - understands the importance of the effect of radiation on damage to genetic material	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
	[BJORL3_W05] has knowledge of the elementary components of matter and the types of fundamental interactions between them, the manifestations of these interactions in phenomena occurring at scales ranging from subatomic to subatomic, knows the time and energy scales associated with these phenomena; knows the basics of biology and ecology in understanding the biological and ecological aspects of nuclear safety and radiation protection	Graduate: - has knowledge of the basic components of the cell involved in the process of expression of genetic information, knows the time and energy scales associated with these phenomena - knows the basic principles of safety behavior associated with exposure to radiation on living organisms	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion [SW3] text preparation/written work [SW5] implementation of a problem task
	[BJORL3_U03] is able to use the formalism of physics and chemistry to describe phenomena in the microworld; is able to use the methodology of biology and ecology to an elementary extent when describing the effects of radiation on biological objects and in the environment	Graduate: - can independently acquire knowledge and expand research and manual skills during simple laboratory work - correctly uses biological terminology, as well as the nomenclature used in describing the phenomena associated with the effects of nuclear radiation on the body and in the environment	[SU1] oral statement/conversation/ discussion [SU3] text preparation/written work [SU4] test/exam - oral or written [SU5] implementation of a problem task [SU8] observation of student's independent or team work
Subject contents	Levels of biological organization (molecular, organismal, population and species). Diversity of modern groups within the Procaryota and Eucaryota - systematic overview and biological characteristics, metabolism, reactivity and coordination, and reproduction of organisms. The main issues of inheritance and evolution, including the evolutionary processes of species formation and extinction.Organization and replication of genetic material of viruses, bacteria and eukaryotic cells. Variability of genetic material: mutagenesis and DNA repair processes, genetic recombination, mobile genetic elements. Stages of gene expression and their regulation in pro- and eukaryotic cells: transcription, translation. Gene expression versus chromatin structure. Methodology in biological research.Review of the most important systematic groups of organisms, taking into account the differentiated structure plans.Basic research methods used in molecular and cellular biology.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		51.0%	10.0%
	Grade-based completion	51.0%	90.0%
Recommended reading	Basic literature	Genetyka molekularna. P. Weglenski PWN 2022 Biochemia. L. Steyer. PWN, Warszawa 2000. Botanika T.1,2. Szejewkowska A., Szejewkowski J. PWN, Warszawa 2006. Biologia zwierząt. Krotkie wykłady Jurd PWN Warszawa 2006	
	Supplementary literature	Biologia molekularna. Krotkie wykłady. Turner P.C. i wsp. PWN, Warszawa, 2007 Biologia rozwoju. Krotkie wykłady Twyman PWN Warszawa 2005 Podstawy Biologii Komorki, B. Alberts; PWN, Warszawa 1999 Podstawy inzynierii genetycznej, Kur, J. Gdansk 1989	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	not applicable		

Work placement	Not applicable
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