University of Gdańsk

Subject card

Subject name and code	Biochemical ecology, PG_00103537		
Field of study	Environmental Protection		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
Education level	Bachelor's studies	Subject group	Optional subject group
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	3	Language of instruction	Polish
Semester of study	5	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Natural Products Analysis -> Department of Environmental Analysis -> Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. Marek Gołębiowski	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

Additional information:

multimedia-based lecture

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	30	5.0	15.0	50

Subject objectives

The aim of the lecture will be to familiarize students with biochemical ecology as a science that studies chemical interactions between living organisms and their interactions with the environment. Familiarization with chemical compounds and their role in the interactions of plants and animals with the environment. To familiarize students with practical aspects of interactions between organisms, such as plant resistance and pest control.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OŚL3_U01] Performs tasks under supervision and independently in the field of analysis of the natural environment and the functioning of natural and man-made natural systems.	1. can present and describe the chemical mechanisms of adaptation of plants to stressful conditions 2. can present and describe the chemical basis of interactions between organisms 3. can present and describe the chemical defense of organisms 4. can present and describe selected bioinsecticides used to fight harmful insects 5. can present and describe the biochemical basis of plant resistance to diseases	[SU4] test/exam - oral or written
[OŚL3_W02] Characterises the relationships and relationships between various disciplines of natural sciences and science, uses knowledge of mathematics, physics, chemistry and biology in the description of basic concepts, concepts and principles in environmental protection.	1. defines concepts related to biochemical ecology	[SW4] test/exam - oral or written
[OŚL3_K05] Identifies the level of her/his knowledge and skills, demonstrates the need to update knowledge about the environment and its protection, demonstrates the need for continuous professional training and personal development.	1. understands the need for further education to obtain specialized qualifications	[SK4] test/exam - oral or written
[OŚL3_W05] Explains the course of natural and anthropopressional physical, chemical and biological processes and phenomena occurring in nature at various levels of matter organisation.	1. knows the processes and phenomena occurring in nature	[SW4] test/exam - oral or written
[OŚL3_U04] Uses specialist language in the discussion and properly uses the nomenclature in the field of environmental protection and individual disciplines related to it.	1. talks about ecological issues using professional terminology	[SU4] test/exam - oral or written
[OŚL3_W08] Explains the mechanisms of economic and consumer pressure on the environment and recognises the possibilities of reducing it using the latest knowledge and scientific achievements.	1. understands the literature regarding biochemical ecology	[SW4] test/exam - oral or written

Subject contents

Biochemical adaptation of plants to climatic and soil conditions. Mechanisms of detoxification of fungicides, herbicides and phenolic compounds. Biochemistry of plant pollination: the role of nectar, pollen, color and scent of flowers. Plant toxins and their effect on animals. Hormonal interactions between plants and animals. Molting and juvenile hormones of insects found in plants. Insect feeding preferences: selection of plants by insects, compounds of secondary metabolism as attractants and repellents. Food preferences of vertebrates: choice of food of plant origin, substances determining taste and taste modifiers. Pheromones and animal defense substances. The use of bioinsecticides. Plant-insect allelochemical interactions. Biochemical interactions between higher plants and higher plant-lower plant interactions. Biochemical basis of plant resistance to diseases. Phytotoxins in plant diseases.

Prerequisites and co-requisites

Knowledge of the basics of chemistry, biochemistry, ecology and biology

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written exam with test and open questions	51.0%	100.0%

Recommended reading

Basic literature	1. Harborne L. B. Ekologia biochemiczna. Wydawnictwo Naukowe PWN, Warszawa, 1997. 2. Kączkowski J. Biochemia roślin. Wydawnictwo Naukowe PWN, Warszawa, 1993. 3. KohlmunzerS. Farmakognozja. Wydawnictwo Lekarskie PZWL, Warszawa, 1993.
Supplementary literature	1. Ostroumow S.A.: Introduction to biochemical ecology, PWN, Warszawa, 1992 2. Oleszek W., Głowiak K., Leszczyński B.: Biochemical environmental interactions, Wydawnictwo Akademii Medycznej w Lublinie, Lublin, 2001 3. Kociołek-Balawejder E., Stanisławska E.: Environmental chemistry, Wydawnictwo Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, Wrocław 2012

	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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