

**Subject card**

<b>Subject name and code</b>	Bioindication, PG_00103748						
<b>Field of study</b>	Natural Resources Conservation						
<b>Date of commencement of studies</b>	October 2023	<b>Academic year of realisation of subject</b>			2025/2026		
<b>Education level</b>	Bachelor's studies	<b>Subject group</b>			Optional subject group		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	3	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	5	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>			exam		
<b>Conducting unit</b>	Laboratory of Plant Taxonomy -> Department of Plant Taxonomy and Nature Conservation -> Faculty of Biology -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Eugeniusz Pronin				
	<b>Teachers</b>		dr Magdalena Oset				
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	15.0	0.0	0.0	0.0	0.0	15
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	15		0.0		0.0	15
<b>Subject objectives</b>	<p>Learning the basic ecological laws used in bioindication.</p> <p>Ability to distinguish and use bioindicators for a comprehensive assessment of the state of the environment.</p> <p>Knowledge of bioindicative properties of individual groups of organisms.</p> <p>Ability to properly select bioindication methods and their application in practice.</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OZPL3_W07] The graduate has an advanced understanding of the methods and means of nature and environmental protection, including nature monitoring	O_W07 - presents the most important methods and methods of nature conservation used in bioindication and knows the basic concepts and terminology of nature used in bioindication and the research methods used in it, and is also aware of their potential translation into practical activities	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	[OZPL3_W11] The graduate possesses a fundamental understanding of the concepts and terminology of natural science, as well as knowledge of the evolution of natural sciences and the research methods employed in them. They are also cognizant of the potential for practical application	(O_W11) - knows the basic concepts and terminology of nature used in bioindication and the research methods used, and is also aware of their potential translation into practical activities	[SW4] test/exam - oral or written
	[OZPL3_K08] The graduate is ready to systematically update his/her natural knowledge and to apply it in practice	O_K08 - is familiar with key methods and techniques of nature conservation based on bioindication and is proficient in the basic terminology and concepts related to this field. They possess knowledge of the research methods used in bioindication and understand their significance for environmental protection. Additionally, they are prepared to systematically update their knowledge of the natural sciences and apply it practically in various situations related to nature conservation.	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written [SK8] observation of student's independent or team work
	[OZPL3_K05] The graduate is ready to understand the need to improve their own competences, update their knowledge and improve their skills	(O_K05) - is aware of the need to improve bioindication knowledge	[SK1] oral statement/conversation/ discussion
	[OZPL3_U03] The graduate is able to search for and use available sources of biological information, including electronic sources, and critically analyse them	O_U03 - posługuje się znajomością technik wyszukiwania źródeł informacji z zakresu bioindykacji w elektronicznych bazach danych oraz Internecie	[SU1] oral statement/conversation/ discussion
	[OZPL3_U02] The graduate can read with comprehension scientific texts in the field of natural sciences in Polish and simple texts in English	O_U02 - uses Polish literature and simple texts in English in the field of bioindication	[SU1] oral statement/conversation/ discussion
	Subject contents	<p>Theoretical bases of bioindication and distinguishing bioindicators (definitions, mechanisms, conditions).</p> <p>Examples of various organisms and groups of organisms used as bioindicators.</p> <p>Principles of using bioindication in ecological research.</p> <p>Monitoring environmental pollution and changes in biocenoses using bioindication methods.</p> <p>Various aspects of the practical use of bioindication in the protection of biodiversity, agriculture and forestry</p>	
Prerequisites and co-requisites	Basic knowledge of botany and systematics of plant organisms.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	exam	51.0%	100.0%

Recommended reading	Basic literature	<p>A. Literature required to finally pass the course (pass the exam):</p> <p>A.1. used during classes:</p> <p>Burchardt L. (eds.). 1994. Teoria i praktyka badań ekologicznych. Idee ekologiczne t. 4, seria Szkice nr 3, UAM, Sorus, Poznań. (in Polish)</p> <p>Falińska K. 1996. Ekologia roślin. PWN, Warszawa. Fałtynowicz W. 1995. Wykorzystanie porostów do oceny zanieczyszczenia powietrza. CEEW, Krosno. (in Polish)</p> <p>Mróz, W. Monitoring Siedlisk Przyrodniczych. Przewodnik Metodyczny. Część II i IV., [Mróz, W., (eds.); Główny Inspektorat Ochrony Środowiska, Warszawa, 2012 i 2015 (in Polish)</p> <p>A.2. studied independently by the student:</p> <p>Pullin A. S. 2004. Biologiczne podstawy ochrony przyrody. PWN, Warszawa. Zimny H. 2005. Ekologia miasta. Agencja Reklam.-Wyd. A. Grzegorzcyk, Warszawa. (in Polish)</p>
	Supplementary literature	<p>Krebs Ch. 2001. Ekologia. Eksperymentalna analiza rozmieszczenia i liczebności. PWN. Warszawa. (in Polish)</p> <p>Markert B. (eds.). 1993. Plants as Biomonitors. VCH, Wienheim-New York-Basel-Cambridge.</p> <p>Żółkoś K., Kukwa M., Afranowicz-Cieślak R. 2013. Changes in the epiphytic lichen biota in Scots pine (<i>Pinus sylvestris</i>) stands affected by a colony of grey heron (<i>Ardea cinerea</i>): a case study from northern Poland. <i>Lichenologist</i> 45(6): 815-823.</p> <p>Banaś K. 2016. The principal regulators of vegetation structure in lakes of north-west Poland. A new approach to the assembly of macrophyte communities. Wydawnictwo Uniwersytetu Gdańskiego. Gdańsk</p> <p>Latałowa M., Pędziszewska A., Maciejewska E., Święta-Musznicka J. 2013. Tilia forest dynamics, <i>Kreitschmaria deusta</i> attack, and mire hydrology as palaeoecological proxies for mid-Holocene climate reconstruction in the Kashubian Lake District (N. Poland). <i>The Holocene</i> 23(5): 667-677</p> <p>Lenarczyk J., Kołaczek P., Jankovská V., Turner F., Karpińska-Kołaczek M., Pini R., Pędziszewska A., Zimny M., Stivrins N., Szymczyk A. 2015. Palaeoecological implications of the subfossil <i>Pediastrum argentinense</i>-type in Europe. <i>Rev. Palaeobot. Palynol.</i> 222: 129-138.</p> <p>Pełechaty i Pronin 2015: Rola Roślinności Wodnej i Szuwarowej w Funkcjonowaniu Jezior i Ocenie Stanu Ich Wód. <i>Stud. Limnol. Telmatologica</i>, 9, 253 (in Polish)</p>
	eResources addresses	<p>Supplementary</p> <p><a href="https://siedliska.gios.gov.pl/publikacje-menu/przewodniki-metodyczne/dla-siedlisk-przyrodniczych?view=article&amp;id=438">https://siedliska.gios.gov.pl/publikacje-menu/przewodniki-metodyczne/dla-siedlisk-przyrodniczych?view=article&amp;id=438</a> - Mróz, W. Monitoring Siedlisk Przyrodniczych. Przewodnik Metodyczny. Część II, [Mróz, W., (red.)]; Główny Inspektorat Ochrony Środowiska, Warszawa, 2012 - access 05.06.2025</p> <p><a href="https://siedliska.gios.gov.pl/images/pliki_pdf/publikacje/Monitoringsiedlisk-przyrodniczych.-Przewodnik-metodyczny.-Cz-IV.pdf">https://siedliska.gios.gov.pl/images/pliki_pdf/publikacje/Monitoringsiedlisk-przyrodniczych.-Przewodnik-metodyczny.-Cz-IV.pdf</a> - Mróz, W. Monitoring Siedlisk Przyrodniczych. Przewodnik Metodyczny. Część IV, [Mróz, W., (red.)]; Główny Inspektorat Ochrony Środowiska, Warszawa, 2015 access 05.06.2025</p>
Example issues/ example questions/ tasks being completed		

Work placement	Not applicable
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