

Subject card

Subject name and code	Applied lichenology, PG_00179655						
Field of study	Environmental Protection						
Date of commencement of studies	October 2026		Academic year of realisation of subject		2027/2028		
Education level	Master's studies		Subject group		Optional subject group		
Mode of study	full-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		2.0		
Learning profile	academic		Assessment form		credit		
Conducting unit	Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Emilia Ossowska				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	30.0	0.0	0.0	30
	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	30		6.0		14.0	50
Subject objectives	1. Equipping the student with knowledge of lichen symbiosis and its components (bionts), structure of lichen thallus and lichen secondary metabolites. 2. Ability to description of lichen components using microscopic, chemotaxonomic and molecular methods. 3. Equipping students with basic knowledge of lichens, their biological properties, importance in nature and natural values in the context of bioindication and conservation.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[OŚMU2_U07] Has advanced skills in presenting the results of own research, discussions based on literature data and public speaking, including leading a debate.	Has advanced skills in presenting the results of own research, discussion based on literature data and public speaking, including debate	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[OŚMU2_K02] Recognises threats, creates safe work conditions and is responsible for the safety of own and other people's work.	Recognizes hazards, creates safe working conditions and takes responsibility for the safety of his/her own work and that of others	[SK6] demonstration of practical skills
	[OŚMU2_U01] On the basis of the acquired knowledge, proposes to solve environmental problems.	Based on its knowledge, it propose solutions to problems in the nature environmental protection	[SU1] oral statement/conversation/discussion
	[OŚMU2_W04] Chooses methods, techniques and research tools used in environmental protection.	Select methods, techniques and research tools used in nature conservations	[SW1] oral statement/conversation/discussion [SW3] text preparation/written work
	[OŚMU2_W03] Characterises the effects of human interference in the natural environment and explains the mechanisms of reaction of living organisms to its pollution.	Characterizes the effects of human interference with the natural environment and explains the mechanisms by which living organisms react to its pollution	[SW1] oral statement/conversation/discussion [SW2] presentation/project/paper/report [SW3] text preparation/written work
	[OŚMU2_U03] Plans and performs research tasks in the field or laboratory and interprets research results on environmental issues (working individually or in a team assuming various roles, including managerial functions).	Plans and carries out research tasks in the field or laboratory and interprets research results on environmental issues works individually or as part of a team taking on a variety of roles, including managerial roles	[SU1] oral statement/conversation/discussion [SU5] implementation of a problem task
	[OŚMU2_K01] Behaves in a professional manner at all times; bears full responsibility for the actions taken relating to the protection of the environment and respects the principles of professional ethics and principles of intellectual honesty.	Behaves professionally in all situations, takes fully responsibility for actions undertaken in relation to the protection of the environment and observes the principles of professional ethics and intellectual honesty	[SK6] demonstration of practical skills
	[OŚMU2_U05] Searches, selects and analyses the literature achievements of environmental sciences, including scientific journals and databases, reading and understanding scientific texts in her/his native language and in English.	Searches, selects and analyses the literature of the environmental sciences, including scientific journals and databases, reads with comprehension scientific texts in the mother tongue and english	[SU1] oral statement/conversation/discussion [SU5] implementation of a problem task
	[OŚMU2_W01] Describes complex phenomena and processes occurring in nature, including those related to the spread of anthropogenic pollution.	It Describes in depth way the complex phenomena and processes occurring in nature, including those related to the spread of anthropogenic pollution	[SW1] oral statement/conversation/discussion [SW5] implementation of a problem task
	[OŚMU2_W05] Describes development directions and the latest discoveries in the field of scientific disciplines related to environmental protection.	Describes in depth the developments and latest discoveries in the of scientific disciplines related to environmental protection	[SW2] presentation/project/paper/report
Subject contents	The basics of fungal systematic. Structure of the lichen thallus and their bionts. Lichen Secondary metabolites and thin_layer chromatography as a method for their detection and identification. Barkoding as a method of lichen identification. Lichen species under legal protection. Red lists of threatened lichens (national and regional). Lichens as indicators of changes in nature conditions (influence of pollution on license occurrence, lichens as indicators of the condition of forest ecosystems). FieldclassesintheTri-city araa.a		
Prerequisites and co-requisites	Absent		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Colloquium 1	51.0%	25.0%
	Colloquium 2	51.0%	25.0%
	Laboratoryjne exercise report	51.0%	25.0%
	Practical assessment	51.0%	25.0%

Recommended reading	Basic literature	Szweykowska A., Szweykowski J. 2009. Botanika. Tom 1 i 2. PWN, Warszawa. Müller E., Loeffler W. 1987. Zarys Mykologii. PWRiL, Warszawa. Bystrek J. 1997. Podstawy lichenologii. Wydaw. Uniwersytetu Marii Curie-Skłodowskiej.
	Supplementary literature	Guzow-Krzemińska B. 2012. Molecular approaches in conservation of lichens. In: Lichen protection - Lichen protected species. Lipnicki L. (ed.) p. 77- 89. Guzow-Krzemińska B., Kukwa M. 2013. Metody badawcze we współczesnej taksonomii porostów. Kosmos 62(1): 95-103. Kubiak D., Kukwa M. 2011. Chromatografia cienkowarstwowa (TLC) w lichenologii. W: Dynowska M., Ejdyś E. (red.). Mikologia laboratoryjna. Przygotowanie materiału badawczego i diagnostyka. Wydawnictwo Uniwersytetu Warmińsko-Mazurskiego w Olsztynie, s. 176190. Kukwa M. 2012. Chemical and molecular methods and their impact on the estimation of threat status of lichens in Poland. W: Lipnicki L. (red.). Lichen protection Lichen protected species. SONAR Sp. z o.o., Gorzów Wielkopolski, s. 93100. Ossowska E. 2021. Rodzaj <i>Parmelia</i> w Polsce. Studium taksonomiczne. - Wydawnictwo Uniwersytetu Gdańskiego, Gdańsk. Ossowska E., Guzow-Krzemińska B., Szymczyk R., Kukwa M. 2021. A molecular re-evaluation of <i>Parmelia encryptata</i> with notes on its distribution. Lichenologist 53, 341345. Ossowska E., Guzow-Krzemińska B., Kolanowska M., Szczepańska K., Kukwa M. 2019. Morphology and secondary chemistry in species recognition of <i>Parmelia omphalodes</i> group evidence from molecular data with notes on the ecological niche modelling and genetic variability of photobionts. MycoKeys 61: 3974. Kosecka M., Kukwa M., Jabłońska A., Flakus A., Rodriguez-Flakus P., Ptach Ł., Guzow-Krzemińska B. 2022. Phylogeny and Ecology of <i>Trebouxia</i> Photobionts From Bolivian Lichens. Front. Microbiol. 13:779784. Oset M. 2014. The lichen genus <i>Stereocaulon</i> (Schreb.) Hoffm. in Poland - a taxonomic and ecological study. - Monographiae Botanicae 104: 1-81
	eResources addresses	
Example issues/ example questions/ tasks being completed	Zone V on the lichen scale is characterized by the occurrence of? Give (4-5) examples of morphological characteristics to help identify lichens. How does the morphological type of the lichen thallus show in the figure below. Please briefly characterize it.	
Work placement	Not applicable	

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