University of Gdańsk

Subject card

Subject name and code	Long-term changes in the natural environment, PG_00198111						
Field of study	Natural Resources Conservation						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	Bachelor's studies		Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study			
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	3.0			
Learning profile	academic		Assessment form	exam			
Conducting unit	Laboratory of Paleoecology and Archaeobotany -> Department of Plant Ecology -> Faculty of Biology -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Anna Pędziszewska				
	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						
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		4.0		41.0	75
Subject objectives	To provide a basic knowledge of long-term environmental change as a basis for assessing contemporary natural processes and possible environmental changes in the future. Demonstrate the need for interdisciplinary research, taking into account the geological time scale, for understanding the mechanisms of environmental change. To get acquainted with the possibilities of using bioindicative properties of various groups of organisms for paleoenvironmental reconstructions. To acquire the theoretical knowledge and practical skills needed to select paleoecological methods and sites.						

Learning outcomes

Course outcome	Subject outcome	Method of verification
[OZPL3_W11] The graduate have an advanced knowledge and 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	Is familiar with basic paleoecological concepts and terminology and is aware of their of their potential use in predicting future environmental changes	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[OZPL3_W05] The graduate understands the principles and mechanisms of life at the population, biocenosis, and ecosystem levels, as well as the temporal and spatial factors that influence biodiversity.	explains the basic rules and describes the mechanisms of functioning of ecosystems and the temporal and spatial determinants of changes in the natural environment	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
[OZPL3_W06] The graduate has an advanced understanding of the names and types of natural environments, including their structural and functional characteristics	names the types of paleoecological sites and characterizes the degree of of transformation of the natural environment	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion

Subject contents

Problems of Quaternary paleoecology, especially of the late Pleistocene and Holocene. The importance of studies of long-term environmental transformations of the environment for understanding the current dynamics and assessing future changes in abiotic and biotic components of the environment at local, regional and global scales. Natural archives of nature as a source of knowledge on vegetation history, climate change and the role of humans in environmental transformations. Lithological classifications and methods of absolute dating. Review of paleobotanical, paleozoological and geochemical; application of molecular biology in paleoecology; use of bioindicative properties of various groups of organisms for reconstruction of specific elements of terrestrial and aquatic environments. Carbon analysis as a tool for reconstructing fire phenomena and inferring the effects of fire and fires on vegetation and climate. Reconstructions of changes in vegetation and climate of Europe in the Quaternary against the background of the Iversen's theory of climate-edaphic cycles. Bond cycles. Hypotheses on the extinction of large mammals at the end of the Pleistocene. Outline of the history of The vegetation of Poland after the retreat of the last glaciation, with special emphasis on Pomerania. The spread of human groups.Chronology of prehistoric cultures. Natural conditions of prehistoric settlement. Reconstruction of the economy and environmental changes underInfluence of the activity of prehistoric cultures in Pomerania. Archaeobotany - study of plant remains at archaeological sites. Plantscultivated and harvested from the wild in the prehistoric and medieval economy; plants in healing and magic; reconstruction of economic processeseconomy (soil conditions of crops, harvesting and cleaning of crops, breeding and feeding of domestic animals). Examples of interdisciplinaryprojects currently underway in Europe and Poland.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Test exam. choice and completion test	51.0%	100.0%

Recommended reading

Basic literature

Alverson K.D., Bradley R.S., Pedersen T.F. 2003. Paleoclimate, Global Change and the Future. Springer, Berlin-Heidelberg-New York. Andersen B.C., Borns Jr. H.W. 1997. The Ice Age World. Scandinavian Univ. Press, Oslo-Boston. Elias i in. 2005-2007. Encyclopedia of Quaternary Sciences. Elsevier. Berglund B.E. 1986. Handbook of Holocene Palaeoecology and Palaeohydrology. Wiley & Sons, Chichester-New York. Birks H.J.B., Birks H.H. 1980. Quaternary Palaeoecology. E. Arnold, London. Gornitz V. (red.). 2009. Encyclopedia of Paleoclimatology and ancient Environments. Springer, Dordrecht, The Netherlands. Mackay A., Battarbe R., Birks J., Oldfield F. 2003. Global change in the Holocene. Arnold, New York. Ralska-Jasiewiczowa M., Latałowa M., Wasylikowa K., Tobolski K., Madeyska E., Wright HE., Turner Ch. 2004. Late Glacial and Holocene vegetation in Poland based on isopollen maps. W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków. Roberts N. 2014. The Holocene. An Environmental History. Blackwell, Oxford.

	Supplementary literature	Mojski J.E. 2005. Ziemie polskie w czwartorzędzie. Zarys morfogenezy. PIG, Warszawa. Latałowa M., Pędziszewska A., Maciejewska E., Święta-Musznicka J. 2013. Tilia forest dynamics, Kreitzschmaria deusta attack, and mire hydrology as palaeoecological proxies for mid-Holocene climate reconstruction in the Kashubian Lake District (N. Poland). The Holocene 23(5): 667-677. Pędziszewska A., Tylmann W., Witak M., Piotrowska N., Maciejewska E., Latałowa M. 2015. Holocene environmental changes reflected by pollen,diatoms, and geochemistry of annually laminated sediments of Lake Suminko in the Kashubian Lake District (N Poland). Review of Paleobotany andPalynology 216: 55-75.Feurdean A., Vannière B., Finsinger W., Warren D., Connor S.C., Forrest M., Liakka J., PanaitA., Werner C., Andrič M., Bobek P., Carter V.A., DavisB., Diaconu A.-C., Dietze E., Feeser I., Florescu I., Gałka M., GieseckeT., Jahns S., Jamrichová E., Kajukało K., Kaplan J., Karpińska-Kołaczek M.,Kołaczek P., Kuneš P., Kupriyanov D., Lamentowicz L., Lemmen C., Magyari E.K., Marcisz K., MarinovaE., Niamir A., Novenko E., Obremska M.,Pędziszewska A., Pfeiffer M., Poska A., RöschM., Słowiński M., Stančikaitė M., Szal M., Święta-Musznicka J. i.in. 2020. Fire hazard modulation bylong-term dynamics in land cover and dominant forest type in eastern and central Europe. Biogeosciences 17: 12131230.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Topics implemented in the lecture: Review of methods and problems of Quaternary paleoecology. Outline of transformations of the natural environment of Europe in the Quaternary against the background of the theory of climatic-edaphic cycles; transformations of the natural environment of Poland after the cessation of the last glaciation, taking into account the impact of settlement and prehistoric economy. Predictions of future climate change.Sample exam questions: Briefly explain the term AnthropoceneThe radiocarbon method (14C) allows dating of organic material in the range of: a. up to 50,000 years. b. up to 500,000 years. c. up to 5,000 years. d. up to 1 million years.	
Work placement	Not applicable	

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