University of Gdańsk

Subject card

Subject name and code	Natural extreme phenomena (Lecture), PG_00196162						
Field of study	Physical geography and geoinformation						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
Education level	Master'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	3		ECTS credits	2.0			
Learning profile	academic		Assessment form	exam			
Conducting unit	Climate Research Laboratory -> Department of Physical Oceanography and Climate Research -> Faculty of Oceanography and Geography -> Rector						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Mirosława Malinowska				
	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		2.0		18.0	50
Subject objectives	To familiarize students with the following contents:1. Types, causes and locations of natural extreme phenomena (meteorological, hydrological and geomorphological).2. Selected social, economic and ecological aspects of the occurrence of natural extreme phenomena and their risk reduction.3. The organization of systems of hazard risk assessment and reduction.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GFGMU2_W01] knows and understands to a deepened extent the specificity of Earth sciences in the field of physical geography, its internal structure, research subject and main research directions, the methods applied, conceptual apparatus, as well as practical applications of scientific achievements	He knows and understands the conceptual apparatus, as well as the practical applications of scientific achievements in the analysis of the theory of analysis of extreme phenomena,	[SW4] test/exam - oral or written
	[GFGMU2_U05] is able to integrate knowledge from the discipline of Earth and environmental sciences, explaining and interpreting the interrelationships between environmental processes and phenomena in order to solve research problems in physical geography and geoinformation	Is able to integrate knowledge from the discipline of earth and environmental sciences, correctly explaining and interpreting the interrelationships between environmental processes and phenomena in order to solve research problems of modern climatology, hydrology and geomorphology in the context of the analysis of natural extreme phenomena	[SU4] test/exam - oral or written
	[GFGMU2_U02] is able to precisely and appropriately use terminology in the field of physical geography and geoinformation in oral statements and written works	Able to proficiently and appropriately apply terminology from the analysis of natural extreme phenomena in written work	[SU4] test/exam - oral or written
	[GFGMU2_W02] knows and understands to a deepened extent issues in the field of exact sciences enabling the understanding of complex processes and phenomena occurring in the Earth's natural environment, and in their interpretations consistently relay on empirical foundations, using qualitative and quantitative methods	He knows and understands the issue of the formation of natural extreme phenomena as a consequence of the occurrence of complex processes and phenomena occurring in the Earth's natural environment, and in their interpretation consistently relies on empirical foundations, using qualitative and quantitative methods	[SW4] test/exam - oral or written
	[GFGMU2_U04] is able, either independently or as part of a group, to formulate and test hypotheses regarding the causes and progression of physical-geographical processes and phenomena; selects and applies advanced research methods and tools, including statistical and geoinformatics methods, adapting them to the context where necessary; skilfully visualises the results of spatial data analysis, critically interprets the findings, and formulates conclusions and their own position based on these, which they justify in debate	Able to describe and analyze the causes and course of natural extreme phenomena, skillfully selecting and applying advanced techniques and research tools from the field of statistical methods, interpreting the results obtained as a consequence, and then using theoretical knowledge to formulate their own opinions and conclusions	[SU4] test/exam - oral or written
	[GFGMU2_K01] is able to behave appropriately in the workplace and in everyday life by critically evaluating information received in the light of their existing knowledge, recognising the importance of knowledge in solving cognitive and practical problems, and, when faced with difficulties, drawing on expert knowledge	He is ready to critically evaluate his knowledge of natural extreme phenomena, to supplement it and to verify his knowledge and skills through critical reading of the literature on the subject	[SK8] observation of student's independent or team work
	[GFGMU2_K02] is prepared to undertake or co-organise initiatives in the public interest, fulfil its social responsibilities and organise activities promoting sustainable development	He is ready to be active in raising awareness about natural extreme phenomena and their consequences in human life	[SK8] observation of student's independent or team work

	Course outcome	Subject outcome	Method of verification
	[GFGMU2_W08] knows and understands in a deepened extent the most important contemporary problems in the field of contemporary climate change and environmental crises on a regional and global scale, their essence, genesis and possible consequences	Knows and understands the problem of occurrence of natural extreme phenomena on a regional and global scale, their essence, genesis, possible consequences and techniques for analyzing their occurrence,	[SW4] test/exam - oral or written

Subject contents

1. Basic concepts and definitions in the problem of natural disaster research and risk reduction.2. Overview of the types of meteorological, hydrological and geomorphological extreme events.3. Social vulnerability and social susceptibility to natural hazards as an element of risk.4. Social, economic and environmental aspects of natural disasters.5. Effects of disaster events on sectors of the national economy.6. Global and regional models of disaster risk reduction strategies. The Hyogo Action Plan 2005-2015, the Sendai Declaration and the Sendai Framework 7. Action Plan 2016-2030 as examples of the organization of the global framework.8. emergency management system - organization in Poland, comparisons with different countries, strengths and weaknesses.9. the role of communication and public education as part of the process of disaster risk reduction.10. Examples of disaster prevention and disaster risk reduction - examples of urban areas.11. The impact of global climate change and adaptation as additional determinants of the problem of disaster research and risk reduction.

Prerequisites and co-requisites

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written assessment	51.0%	100.0%

Recommended reading

Basic literature

Falarz M. (ed.), 2021, Climate Chanege in Poland. Past, Present, Future, Springer Climate.

Keller E.A., DeVecchio D.E., 2011, Natural Hazards; Earths Processes as Hazards, Disasters, and Catastrophes. Pearson Prentice Hall.

Kundzewicz Z.W., Matczak P, 2010, Threats of natural extreme events, Nauka 4/2010.Rucińska D., 2012, Extreme natural phenomena and social awareness, UW, Warsaw.

	Supplementary literature	Ciurean R.L., Schröter D., Glade T., 2013, Conceptual Frameworks of Vulnerability Assessments for Natural Disasters Reduction. Approaches to Disaster Management - Examining the Implications of Hazards, Emergencies and Disasters. Coles A., 2001, An Introduction to Statistical Modeling of Extreme Values, Springer. Cyberski J. (red.), 2003, Powódź w Gdańsku 2001, GTN Wydz. V, Gdańsk. IPCC, 2012, Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. Special Report of the IPCC Technical Summary. Cambridge University Press, Nowy Jork. Rosenzweig C., Solecki W.D., Hammer S.A., Mehrotra S., 2011, Climate change and cities. First Assessment Report of the Urban Climate Change Research Network. Soczyńska U. (ed.), 1997, Prediction of precipitation and floods with a given recurrence time, UW, Warsaw.Walmsley D.J., Lewis G.J, 1997, Human geography. Behavioral approaches, PWN, Warsaw, Poland. Wilks D., 2011, Statistical methods in the atmospheric sciences. Academic Press.
	eResources addresses	
Example issues/ example questions/ tasks being completed	Characterize the trends observed today in changes in extreme natural phenomena.Evaluate the organization of the Crisis Management System in PolandEvaluate methods of adaptation to climate change in terms of their impact on mitigating the consequences of extreme natural phenomena	
Work placement	Not applicable	

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