University of Gdańsk

Subject card

Subject name and code	Contemporary climate change (Classes), PG_00201200		
Field of study	Physical geography and geoinformation		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
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	1	Language of instruction	Polish
Semester of study	1	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
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 Janusz Filipiak	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	15.0	0.0	0.0	0.0	15

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	15	2.0	33.0	50

Subject objectives

Description of the current state of the Earth's climate system and the magnitude of the change made from the pre-industrial period.

Identification of the role of humans in the climate system.

Analysis of the scale of the impact of climate change on natural and artificial systems.

Introduction to the issues of adaptation and mitigation of climate change with the identification of their basic methods with the inclusion of renewable energy technologies as one of the methods of stabilizing greenhouse gas emissions.

Learning outcomes	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	Student knows and understands the problem of the contemporary global climate change and its regional aspects, its nature, genesis and possible consequences.	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
	[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	Student is ready to critically assess his knowledge on the contemporary climate change, to supplement it and verify his knowledge and skills through critical reading of the literature on the subject.	[SK1] oral statement/conversation/ discussion [SK5] implementation of a problem task
	[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	Student knows and understands the issues of science with particular emphasis on geophysics that allow him to understand the complex processes and phenomena occurring in the Earth's climate system, and in their interpretation consistently relies on empirical foundations, using qualitative and quantitative methods.	[SW1] oral statement/ conversation/discussion [SW5] implementation of a problem task
	[GFGMU2_U03] is able to use academic literature in the fields of physical geography and geoinformation in Polish and English, selecting it appropriately for the research objective	Student is able to effectively use skillfully selected for the purpose of application scientific literature on the contemporary climate change both in Polish and English.	[SU1] oral statement/conversation/ discussion [SU5] implementation of a problem task
	[GFGMU2_U02] is able to precisely and appropriately use terminology in the field of physical geography and geoinformation in oral statements and written works	Student is able to proficiently and appropriately apply the terminology of the contemporary climate change in oral statements and written works.	[SU1] oral statement/conversation/ discussion [SU5] implementation of a problem task
	[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	Student is able to integrate knowledge of the discipline of earth and environmental sciences, correctly explaining and interpreting the interrelationships between environmental processes and phenomena in order to solve the research problems of modern climatology in the context of the contemporary climate change.	[SU1] oral statement/conversation/ discussion [SU5] implementation of a problem task

Subject contents	1. Introduction to the problem of modern climate change, basic definitions. 2. Attribution of causes of climate variability and change. 3. Impact of climate change on natural and artificial systems. 4. Regional aspects of climate change with special emphasis on Europe and the Baltic Sea basin. 5. Activities of the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC). 6. Climate change adaptation and mitigation, basic definitions. 7. CO2 emission budget. 8. Climate change adaptation methods - general and sectoral approaches. 9. Adaptation of cities. 10. Climate change and energy - considerations for the development of renewable energy sources. 11. Geoengineering.
Prerequisites and co-requisites	-

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Obtain a passing grade on a problem paper	51.0%	100.0%
Recommended reading	Basic literature	IPCC, 2021: Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2391 pp. IPCC, 2023: Sections. In: Climate Change 2023: Synthesis Report. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, 115 pp. IPCC, 2018, Special Report on Global Warming of 1.5°C. Technical Summary. Popkiewicz M., Kardaś A., Malinowski S., 2019, Nauka o klimacie. Wydawnictwo Sonia Draga i Wydawnictwo Nieoczywiste, Warszawa.	

	Supplementary literature	4°C Turn Down the Heat, 2012, A Report for the World Bank by the Potsdam Institute for Climate Impact Research and Climate Analytics, Potsdam. Czernecki B. Miętus M., 2015, The thermal seasons variability in Poland, 19512010. Theoretical and Applied Climatology, doi: 10.1007/ s00704-015-1647-z. 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. IPCC, 2012, Renewable Energy Sources and Climate Change Mitigation. Special Report of the IPCC Technical Summary. Cambridge University Press, Nowy Jork. Filipiak J., Malinowska M., 2013, Międzynarodowe negocjacje klimatyczne cele, proces, narzędzia. Rola Polski i Unii Europejskiej w dialogu światowym [w:] Kuczewska J., Stefaniak-Kopoboru J., Krzemiński M. Ekonomiczne wyzwania współczesności, FRUG, Sopot, 137-151. Jakusik E., Wójcik R., Pilarski M., Biernacik D., Miętus M., 2012, Poziom morza w polskiej strefie brzegowej stan obecny i spodziewane zmiany w przyszłości. [w:] Wibig J., Jakusik E., 2012. Warunki klimatyczne i oceanograficzne w Polsce i na Bałtyku Południowym. Spodziewane zmiany i wytyczne do opracowania strategii adaptacyjnych w gospodarce krajowej, Seria Monografie IMGW-PIB, 146-169. Limanówka D., Biernacik D., Czernecki B., Farat R., Filipiak J., Kasprowicz T., Pyrc R., Urban G., Wójcik R., 2012, Zmiany i zmienność klimatu od połowy XX w. [w:] Wibig J., Jakusik E. (red.) Warunki klimatyczne i oceanograficzne w Polsce i na Bałtyku Południowym. . Spodziewane zmiany i wytyczne do opracowania strategii adaptacyjnych w gospodarce krajowej, Seria Monografie IMGW-PIB, 7-32. Miętus M., Biernacik D., Czernecki B., Filipiak J., Marosz M., Owczarek M., Pilarski M., Wójcik R., 2012, Statystyczno-empiryczne projekcje wybranych elementów klimatu Polski na lata 2011-2030 [w:] Wibig J., Jakusik E. (red.) Warunki klimatyczne i oceanograficzne w Polsce i na Bałtyku Południowym. . Spodziewane zmiany i wytyczne do opracowania strategii adaptacyjnych w gospodarce krajowej, Seria Monografie IMGW-PIB, 34-91. Rogelj J., McCollum D.L., Reisinger A., Meinshausen M., Riahi K., 2013, Probabilistic cost estimates for climate change mitigation. Nature 493(7430): 79-83. Marosz M., Wójcik R., Pilarski M., Miętus M., 2013, Extreme daily precipitation totals in Poland during summer: the role of regional atmospheric circulation, Climate Research, doi: 10.3354/cr01155. Sztobryn M., Wójcik R., Miętus M., 2012, Występowanie zlodzenia na Bałtyku stan obecny i spodziewane zmiany w przyszłości. [w:] Wibig J., Jakusik E., 2012. Warunki klimatyczne i oceanograficzne w Polsce i na Bałtyku Południowym. Spodziewane zmiany i wytyczne do opracowania strategii adaptacyjnych w gospodarce krajowej, Seria Monografie IMGW-PIB, 189-215.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. Analysis of the structure of the IPCC reports. 2. The activities of the UNFCCC. 3. The pros and cons of geoengineering techniques.	
Work placement	Not applicable	

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