

**Subject card**

<b>Subject name and code</b>	Contemporary climate change - practical, PG_00153732						
<b>Field of study</b>	Physical geography and geoinformation						
<b>Date of commencement of studies</b>	October 2024	<b>Academic year of realisation of subject</b>			2024/2025		
<b>Education level</b>	postgraduate studies	<b>Subject group</b>			Obligatory subject group in the field of study		
<b>Mode of study</b>	full-time studies	<b>Mode of delivery</b>			at the university		
<b>Year of study</b>	1	<b>Language of instruction</b>			Polish		
<b>Semester of study</b>	1	<b>ECTS credits</b>			2.0		
<b>Learning profile</b>	academic	<b>Assessment form</b>					
<b>Conducting unit</b>	Pracownia Badań Klimatu -> Katedra Oceanografii Fizycznej i Badań Klimatu -> Faculty of Oceanography and Geography						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Janusz Filipiak				
	<b>Teachers</b>		dr Janusz Filipiak prof. dr hab. Mirosław Miętus				
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	0.0	15.0	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		15.0		30.0	60
<b>Subject objectives</b>	<p>Description of the current state of the Earth's climate system and the magnitude of the change made from the pre-industrial period.</p> <p>Identification of the role of humans in the climate system.</p> <p>Analysis of the scale of the impact of climate change on natural and artificial systems.</p> <p>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.</p>						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GFGMU2_U02] 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 modern climate change in oral statements and written works.	[SU1] oral statement/conversation/discussion [SU5] implementation of a problem task
	[GFGMU2_K01] critical assessment of knowledge in the field of Earth and environmental sciences and geoinformation, its completion and verification through critical analysis of scientific literature	Student is ready to critically assess his knowledge of 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] 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 rely 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_W08] the most important contemporary problems on a regional and global scale, their essence, genesis and possible consequences	Student knows and understands the problem of 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_U03] effectively use selected scientific literature in the field of physical geography and geoinformation, both in Polish and English	Student is able to effectively use skillfully selected for the purpose of application scientific literature in the field of physical geography and geoinformation both in Polish and English.	[SU1] oral statement/conversation/discussion [SU5] implementation of a problem task
[GFGMU2_U05] 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 current climate change.	[SU1] oral statement/conversation/discussion [SU5] implementation of a problem task	
Subject contents	<ol style="list-style-type: none"> <li>1. Introduction to the problem of modern climate change, basic definitions.</li> <li>2. Attribution of causes of climate variability and change.</li> <li>3. Impact of climate change on natural and artificial systems.</li> <li>4. Regional aspects of climate change with special emphasis on Europe and the Baltic Sea basin.</li> <li>5. Activities of the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC).</li> <li>6. Climate change adaptation and mitigation, basic definitions.</li> <li>7. CO2 emission budget.</li> <li>8. Climate change adaptation methods - general and sectoral approaches.</li> <li>9. Adaptation of cities.</li> <li>10. Climate change and energy - considerations for the development of renewable energy sources.</li> <li>11. Geoengineering.</li> </ol>		
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	<p>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.</p> <p>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.</p> <p>IPCC, 2018, Special Report on Global Warming of 1.5°C. Technical Summary.</p> <p>Popkiewicz M., Kardaś A., Malinowski S., 2019, Nauka o klimacie. Wydawnictwo Sonia Draga i Wydawnictwo Nieoczywiste, Warszawa.</p>
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	Supplementary literature	<p>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.</p> <p>Czernecki B., Miętus M., 2015, The thermal seasons variability in Poland, 19512010. Theoretical and Applied Climatology, doi: 10.1007/s00704-015-1647-z.</p> <p>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.</p> <p>IPCC, 2012, Renewable Energy Sources and Climate Change Mitigation. Special Report of the IPCC Technical Summary. Cambridge University Press, Nowy Jork.</p> <p>Filipiak J., Malinowska M., 2013, Międzynarodowe negocjacje klimatyczne cele, proces, narzędzia. Rola Polski i Unii Europejskiej w dialogu światowym [w:] Kuczevska J., Stefaniak-Kopoboru J., Krzemiński M. Ekonomiczne wyzwania współczesności, FRUG, Sopot, 137-151.</p> <p>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.</p> <p>Limanówka D., Biernacik D., Czernecki B., Farat R., Filipiak J., Kasproicz 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.</p> <p>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.</p> <p>Rogelj J., McCollum D.L., Reisinger A., Meinshausen M., Riahi K., 2013, Probabilistic cost estimates for climate change mitigation. Nature 493(7430): 79-83.</p> <p>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.</p> <p>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.</p>
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Analysis of the structure of the IPCC reports.</li> <li>2. the activities of the UNFCCC.</li> <li>3. The pros and cons of geoengineering techniques.</li> </ol>	
Work placement	Not applicable	

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