

**Subject card**

<b>Subject name and code</b>	Climate change, PG_00140223						
<b>Field of study</b>	Archaeology						
<b>Date of commencement of studies</b>	October 2024	<b>Academic year of realisation of subject</b>			2024/2025		
<b>Education level</b>	undergraduate studies	<b>Subject group</b>					
<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>			English English		
<b>Semester of study</b>	2	<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 -> Rektor						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr Mirosława Malinowska				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	30.0	0.0	0.0	0.0	0.0	30
	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>	30		2.0		18.0	50
<b>Subject objectives</b>	The aim of this course is to acquaint students at the primary level with the basics of functioning of the Earth's climate system, the causes of contemporary climate change, spatial diversity and trends in climate change in different regions of the world, the consequences of climate change and methods of climate change prevention and adaptation.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
		<p>K_W05 - Describes the functioning of the Earth's climate system and the factors shaping it, the dynamics of its changes and the interaction between the atmosphere and other components of the natural environment.</p> <p>K_W06 - Describes the influence of changes in the Earth's climate system on interactions taking place between the natural and anthropogenic environment in different spatial and time scales. It gives examples of such interactions. Indicates methods of adaptation to climate change and its mitigation and submits them to critical evaluation.</p> <p>K_U01 - Identifies and analyses basic processes and phenomena occurring in the Earth's climate system and indicates their natural and socio-economic consequences.</p> <p>K_U02 - Formulates and analyses basic social, economic and political problems related to climate protection.</p> <p>K_U08 - Uses scientific language, speaks and discusses climate change issues in English.</p>	<p>[SU1] oral statement/conversation/discussion</p> <p>[SK4] test/exam - oral or written</p>

Subject contents	<ol style="list-style-type: none"> <li>1. The atmospheric system and energy balance;</li> <li>2. Climate change in the past</li> <li>3. The enhanced greenhouse effect</li> <li>4. Contemporary climate change</li> <li>5. Water stored in ice and oceans, and changing sea levels</li> <li>6. Carbon stored in ice, oceans and biosphere</li> <li>7. Extreme weather events.</li> <li>8. Spatial changes in biomes, habitats and animal migration</li> <li>9. Impacts of climate change on humans</li> <li>10. Climate change risk and vulnerability</li> <li>11. Government-led adaptation and mitigation</li> <li>12. Carbon emissions trading and geoengineering</li> <li>13. Civil society and corporate strategies to mitigate climate change</li> <li>14. The most common myths about climate change</li> <li>15. Symptoms of climate change in Poland</li> </ol>		
Prerequisites and co-requisites	English level B2		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	test	51.0%	50.0%
	activity during lecture	51.0%	50.0%
Recommended reading	Basic literature	<p>Popkiewicz M., Kardaś A., Malinowski S., 2019, Climate science. Sonia Draga Publishing House and Nieoczywiste Publishing House, Warsaw.</p> <p>IPCC, 2018, Special Report on Global Warming of 1.5°C. Summary for Policymakers. IPCC, Geneva, Switzerland.</p> <p>IPCC, 2019, Special Report on Climate Change and Land. Summary for Policymakers. IPCC, Geneva, Switzerland.</p> <p>IPCC, 2019, Special Report on Oceans and Cryosphere. Summary for Policymakers. IPCC, Geneva, Switzerland.</p> <p>IPCC, 2021-2022, Climate Change: Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Summaries for Policymakers. IPCC, Geneva, Switzerland</p>	

	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>Alcamo J., Olesen J.E., 2012, Life in Europe Under Climate Change. Wiley.</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.</p> <p>IPCC, 2012, Renewable Energy Sources and Climate Change Mitigation. Special Report of the IPCC Technical Summary. Cambridge University Press.</p> <p>Filipiak J., Malinowska M., 2013, International climate negotiations - objectives, process, tools. The role of Poland and the European Union in the global dialogue [in:] Kuczevska J., Stefaniak-Kopoboru J., Krzeminski M. Economic challenges of today, FRUG, Sopot, 137-151.</p> <p>Masselink G., Gehrels R., 2014. Coastal Environment &amp; Global Change. Wiley.</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>
	eResources addresses	<p>Podstawowe</p> <p><a href="https://link.springer.com/book/10.1007/978-3-030-70328-8?page=2#toc">https://link.springer.com/book/10.1007/978-3-030-70328-8?page=2#toc</a> - Falarz M., (ed.) Climate Change in Poland. Past, Present, Future, Springer, 2021. A description of climate change observed in Poland in the past centuries, today and projected przyszły climate change.</p> <p><a href="https://naukaoklimacie.pl/start">https://naukaoklimacie.pl/start</a> - Climate Science Portal, where you can find reliable information about the Earth's climate system, its modern change, facts and myths about modern climate change</p> <p><a href="https://www.ipcc.ch/sr15/chapter/spm/">https://www.ipcc.ch/sr15/chapter/spm/</a> - IPCC, 2018, Special Report on Global Warming of 1.5°C. Summary for Policymakers. IPCC, Geneva, Switzerland: Special Report from 2018 on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. The report presents the key findings, based on the assessment of the available scientific, technical and socio-economic literature</p> <p><a href="https://www.ipcc.ch/srocc/cite-report/">https://www.ipcc.ch/srocc/cite-report/</a> - IPCC, 2019: IPCC Special Report on the Ocean and Cryosphere in a Changing Climate: report describes the observed changes in the extent of ice on earth and the impact of these changes, triggered by climate change, on ecosystems and humans</p> <p><a href="https://www.ipcc.ch/site/assets/uploads/sites/4/2019/12/02_Summary-for-Policymakers_SPM.pdf">https://www.ipcc.ch/site/assets/uploads/sites/4/2019/12/02_Summary-for-Policymakers_SPM.pdf</a> - IPCC, 2019, Special Report on Climate Change and Land. Summary for Policymakers. IPCC, Geneva, Switzerland. This report addresses greenhouse gas (GHG) fluxes in land-based ecosystems, land use and sustainable land management<sup>4</sup> in relation to climate change adaptation and mitigation, desertification, <sup>5</sup> land degradation<sup>6</sup> and food security.<sup>7</sup></p> <p>Adresy na platformie eNauczanie:</p>
Example issues/ example questions/ tasks being completed		<p>1. Explain what the natural and anthropogenic greenhouse effects are. 2. Describe the observed trends of climate change 3. Give examples of the effects of climate change on components of the environment other than the atmosphere 4. Explain the differences between climate change adaptation and mitigation.</p>
Work placement	Not applicable	

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