University of Gdańsk

Subject card

Subject name and code	Meteorology and Climatology - lecture, PG_00193801						
Field of study	Geography						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2026/2027			
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	1		Language of instruction	Polish			
Semester of study	2		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 Janusz Filipiak				
	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		1.0	19.0	50	
Subject objectives	To acquire basic knowledge of the atmosphere and the processes taking place in it. To recognize and interpret meteorological phenomena and processes in connection with the state of the natural environment. To determine the impact of weather conditions on the geographical environment, economy and human health. Acquire basic knowledge of the causes and consequences of modern global climate change. This subject prepares the student to independently analyze basic problems in atmospheric science.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GEOGRL3-K03] is prepared to social action, including cooperation to preserve the ecological balance and protect the Earth's resources and its sustainable development, using forms of own entrepreneurship for this purpose	The student is prepared to engage in social initiatives, including collaborative efforts, aimed at climate protection, adaptation to climate change, the preservation of ecological balance, and the conservation of the Earth’s resources and its sustainable development.	[SK1] oral statement/conversation/ discussion
	[GEOGRL3-U05] can use scientific language and express opinions and discuss topics related to geography in Polish and a foreign language	Student is able to use scientific language and speak and discuss topics on issues in meteorology and climatology.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
	[GEOGRL3-U02] can use theoretical knowledge in the field of geography and available sources of information to correctly interpret basic natural, social, economic, and political processes and phenomena	The student is able to apply theoretical knowledge of the geographical sciences to formulate and analyse fundamental issues concerning the nature and causes of changes in the Earth’s atmosphere at local, regional and global scales.	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
	[GEOGRL3-U01] can dentify and analyze basic natural and socio-economic processes and phenomena, analyze their causes and course, and formulate and discuss basic issues concerning physical-geographical conditions and the social, economic, and political situation and their changes on various spatial scales	Student is able to identify and analyze basic meteorological and climatic processes and phenomena and analyze their causes and course.	[SU4] test/exam - oral or written
	[GEOGRL3-W04] has advanced knowledge of the Earth's geographical environment, understood as a unified system of interconnected and interacting components; its diversity, functioning, and dynamics of change, including the interaction of environmental components in the area of the South Baltic Coast and Lake District	Student knows and understands to an advanced degree the meteorological and climatic processes and phenomena occurring in the Earth's natural environment, with particular emphasis on such processes and phenomena occurring in Europe, Poland and the Coastal and South Baltic Lake Districts.	[SW4] test/exam - oral or written
	[GEOGRL3-W02] knows and understands key concepts and theories in geography, as well as advanced processes and phenomena related to spatial diversity and the distribution of processes and phenomena on the Earth's surface at various spatial scales, particularly in Poland	Student knows and understands key concepts in meteorology and climatology, as well as theories of spatial variation and distribution of meteorological and climatic processes and phenomena on the Earth's surface.	[SW4] test/exam - oral or written
	[GEOGRL3-W05] knows the interactions between the natural and anthropogenic environments on various spatial and temporal scales, with particular emphasis on the processes and phenomena occurring in the area of the South Baltic Coast and Lake District and the conditions of these interactions	The student has an advanced understanding of the interactions between natural and anthropogenic components of the environment across various spatial and temporal scales, and applies this knowledge to accurately assess the functioning of the climate system at the current stage of global change.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion
	[GEOGRL3-W03] knows and understands on advanced level social, economic, and political diversity in the world, as well as the social, economic, and political characteristics of countries and regions, especially northern Poland and the Pomeranian Province; understanding of socio-economic changes taking place in the modern world	The student has an advanced understanding of the social and economic diversity of the world and the resulting implications for the functioning of the climate system and the need for climate protection.	[SW4] test/exam - oral or written [SW1] oral statement/ conversation/discussion

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<tr><td>Subject contents</td><td>1. Subject of study of meteorology and climatology.
2. Atmosphere (structure and properties, vertical structure, anthropogenic changes in air composition).
3. Radiation of the Sun, Earth and atmosphere.
4. Heat balance of the Earth's surface.
5. Water in the atmosphere.
6. Adiabatic transformations.
7. Circulation of the atmosphere.
8. Synoptic meteorology.
9. Selected issues in climatology: climatogenic processes and factors, features of local climate, zonality and unzonality of climate, teleconnection patterns, classifications of climates, features of the Poland's climate, changes in the climate of the Earth and in particular contemporary change of the Earth's climate, its causes and consequences.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td></td></tr>
<tr><td>Assessment methods and criteria</td><td><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>written/oral exam</td><td>51.0%</td><td>100.0%</td></tr></table></td></tr>
<tr><td>Recommended reading</td><td><table><tr><td>Basic literature</td><td>A.1. used during classes
- Kożuchowski K. (ed.), 2005, Meteorology and climatology, PWN, Warsaw
- Kożuchowski K., 2011, Klimat Polski, PWN, Warszawa
- Woś A., 2001, Meteorology for geographers, PWN, Warsaw.
A.2. studied independently by the student:
- Popkiewicz M., Kardaś A., Malinowski S., 2018, Science of climate. Post Factum Publishing
- Rettalack B.J., 1991, Fundamentals of meteorology, IMGW, Warsaw.
- Woś A., 1999, Klimat Polski, PWN, Warsaw.</td></tr><tr><td>Supplementary literature</td><td>- Bednorz E. (red.), 2023, Atlas klimatu Polski (1991-2020). Wyd. Bogucki.
- Lorenc H., 2005, Atlas klimatu Polski, IMGW, Warszawa.
- Niedźwiedź T. (red.), 2003, Słownik Meteorologiczny, IMGW, Warszawa.
- Ustrnul Z., Czekierda D., 2009, Atlas ekstremalnych zjawisk meteorologicznych oraz sytuacji synoptycznych w Polsce, IMGW.
- Ustrnul Z. (red.), 2014, Atlas zagrożeń meteorologicznych Polski, IMGW-PIB.</td></tr><tr><td>eResources addresses</td><td></td></tr></table></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td>Please describe the mechanism (the physics of the phenomenon) and the significance of the greenhouse effect (both natural and anthropogenic) in shaping Earths climate.
We distinguish between cold fronts of the first and second types. How do they differ from one another?
Why is the solar constant different in January than in July?
Air temperature inversion involves ..... and is characteristic
of ..... type of atmospheric thermal equilibrium.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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