

Arctic and Antarctic under climate warming Educational subject description sheet

Basic information

Study programme Geohazards and Climate Change		Didactic cycle 2023/24	
Speciality -		Subject code 07GCCS.28P.02888.23	
Organizational unit Faculty of Geographical and	Geological Sciences	Lecture languages English	
Study level Second-cycle programme		Course type Elective	
Study form Full-time		Block Basic subjects	
Education profile General academic			
Subject coordinator	Jakub Małecki	·	
Lecturer	Jakub Małecki		
Period Semester 4	Activities and hours Lecture: 15, Graded credit 		Number of ECTS points 2

Goals

Code	Goal
C1	The aim of the course is to familiarize Student with the functioning and the role of cryosphere in various climatic zones and in the Earth system as a whole. Student will be introduced to the most up to date research themes in glaciology. After completing the course Student will be aware of the delicate balance in which cryosphere operates.

Entry requirements

Student has basic knowledgein physical geography and physics.

Subject learning outcomes

Code	Outcomes in terms of	Learning outcomes	Examination methods
Knowledg	Knowledge - Student:		
W1	knows the role of cryosphere in the Earth system;	GCC_K2_W01	Written colloquium
W2	knows the basic definitions in glaciology and glacial geomorphology;	GCC_K2_W15	Written colloquium
W3	knows the research methods in glaciology and can characterise them, as well as indicate advantages and disadvantages;	GCC_K2_W12	Written colloquium
W4	knows and is able to describe the processes within the glaciers and their interactions with various other components of the landscape and environment;	GCC_K2_W01	Written colloquium
W5	understands the geological and historical changes in cryosphere.	GCC_K2_W01, GCC_K2_W17, GCC_K2_W18	Written colloquium
Skills - Student:			
U1	explains and characterises basic processes in cryosphere;	GCC_K2_U14, GCC_K2_U16	Written colloquium
U2	critically discusses the most recent predictions of changes within the cryosphere on the Earth;	GCC_K2_U14, GCC_K2_U16	Written colloquium
U3	characterizes past and contemporary geographical distribution of glaciers on the Earth;	GCC_K2_U14, GCC_K2_U16	Written colloquium
U4	ccritically assesses the information on the cryosphere changes published in media.	GCC_K2_U01, GCC_K2_U06	Written colloquium
Social competences - Student:			
К1	is prepared to discuss, with respect to opponents, the fake-news on the cryosphere changes published in media.	GCC_K2_K03, GCC_K2_K04, GCC_K2_K06	Written colloquium

Study content

No.	Course content	Subject learning outcomes	Activities
1.	The ice in the environment. Ice-sheets and glaciers as the most important element of the cryosphere.	W1, W2, U1, U4, K1	Lecture
2.	Ice-sheet and glaciers mass-balance - the mass and energy exchange between the ice and the atmosphere.	W1, W2, W4, U1, U4, K1	Lecture
3.	The temperature of the ice within the ice-sheet and glacier and its implcation for water circulation and ice- movement.	W2, W4, U1, U4, K1	Lecture
4.	Interaction of the ice-sheets and glaciers with the hydrosphere, atmosphere and Earth surface.	W1, W2, W4, U1, U4, K1	Lecture

No.	Course content	Subject learning outcomes	Activities
5.	The regional glaciology.	W1, W3, W4, W5, U2, U3, U4, K1	Lecture

Additional information

Activities	Teaching and learning methods and activities
Lecture	Lecture with a multimedia presentation of selected issues, Problem-based lecture, Discussion

Activities	Credit conditions
Lecture	The final grade consists in 100% of the grade from wirtten colloqium. Grading scale: 1. very good (5.0) - from 90% of points, 2. good plus (4.5) - from 80% of points, 3. good (4.0) - from 70% of points, 4. sufficient plus (3.5) - from 60% of points, 5. satisfactory (3.0) - from 50% of points, 6. unsatisfactory (2.0) - below 50% of points.

Literature

Obligatory

1. Benn, D. I. and Evans, D. 2014. Glaciers and glaciations. Routledge

Calculation of ECTS points

Activities	Activity hours*
Lecture	15
Reading the indicated literature	15
Preparation for the assessment	20
Student workload	Hours 50
Number of ECTS points	ECTS 2

* academic hour = 45 minutes

Efekty uczenia się dla kierunku

Kod	Treść
GCC_K2_K03	The graduate is ready to communicate, discuss and argue burning issues, hazards and problems associated with the climate, climate and environment changes for wider, non-scientific audience
GCC_K2_K04	The graduate is ready to use reliable sources of information associated with environmental hazards and climate and critical assessments of these sources
GCC_K2_K06	The graduate is ready to think and act creatively
GCC_K2_U01	The graduate can vary between natural and anthropogenic causes of climate change and associated environmental changes and geohazards
GCC_K2_U06	The graduate can critically assess the sources of information on climate and environmental change and associated geohazards
GCC_K2_U14	The graduate can describe in extended degree environmental components and their relationships
GCC_K2_U16	The graduate can transparently and accessibly present the Earth and environmental sciences topics
GCC_K2_W01	The graduate knows and understands thoroughly, the processes operating in the natural environment, their causes, mechanisms, consequences and associated geohazards
GCC_K2_W12	The graduate knows and understands advanced field methods and techniques used in environmental studies
GCC_K2_W15	The graduate knows and understands advanced vocabulary associated with climate change, natural environment and geohazards
GCC_K2_W17	The graduate knows and understands thoroughly, the literature in the field of climate change, geohazards as well as basic environmental and social research
GCC_K2_W18	The graduate knows and understands thoroughly, the most up to date trends in science and implementation of the newest scientific achievements in studies field