SYLLABUS

Environmental Geochemistry 7.5 credits L7024K

Miljögeokemi

Course syllabus admitted: Autumn 2010 Sp 1 - Autumn 2011 Sp 1

DECISION

Kursplanen är fastställd av Institutionen för Tillämpad kemi och geovetenskap 2008-12-15 att gälla från H09.

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LULEÅ TEKNISKA UNIVERSITET

Environmental Geochemistry 7.5 credits L7024K

Miljögeokemi

Second cycle, L7024K

Education level	Grade scale	Subject	Subject group (SCB)
Second cycle	G U 3 4 5		Earth Science and Physical Geography

Entry requirements

Basic course in geology including Quaternary geology. Basic course in chemistry.

Selection

The selection is based on 30-285 credits

Examiner

Johan Ingri

Course Aim

After the course the student should:
- know the main climate archives, be able to explain the type of information that can be obtained from different archives, and be able to perform a basic interpretation of data from a climate archive
- know and be able to describe the most important dating methods used in studies of climate archives
- be able to use the computer programme CALIB to calibrate carbon-14 data
- be able to give an account of:
- the main biogeochemical processes that control the Earth’s climate in different time perspectives
- the use of oxygen isotopes as a climate indicator
- factors controlling the formation and melting of glaciers
- human factors threatening a sustainable development of Earth’s climate, and possible effects of the threat against a sustainable climate
- how climate research has affected the understanding of factors threatening a sustainable climate

Contents

Earth’s climate systems. Forcing factors and feedback mechanisms in the Earth’s climate system. Climate archives and dating methods for climate archives. Carbon-14 dating. Historical climate data. Plate tectonics and climate change. Sea-level changes. Oxygen isotope data. Astronomical parameters controlling the Earth’s climate. Formation and melting of glaciers. Atmospheric greenhouse gases. Human influence on Earth’s climate. Demonstration of web-based climate databases.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.
Basic theory is presented in the form of lectures and short exercises. Basic knowledge in interpretation and calibration of carbon-14 data and interpretation of oxygen isotope data are practised in mandatory exercises that should result in a deeper understanding of the main elements of the course, when students actively participate in the learning process. During an optional field trip in the Luleå area, parts of the basic theory are coupled to practical demonstrations of Quaternary deposits.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.
The ability to describe and give accounts of the basic theory is examined in two written exams. Special emphasis is placed on how climate research has affected the understanding of factors threatening a sustainable climate (grade 3, 4, 5). The ability to interpret data from climate archives, interpret and calibrate carbon-14 data and to interpret oxygen isotope data is examined with mandatory exercises (grade U G).

Overlap

The course L7024K is equal to L0011K

Literature. Valid from Autumn 2009 Sp 1

Ruddiman, W. F., 2008. Earths Climate: Past and Future. W. H. Freeman and Company.

Course offered by

Department of Civil, Environmental and Natural Resources Engineering

Items/credits

Number	Type	Credits	Grade
0003	Exercises	2.9	U G#
0004	Written exam part 1	2.3	G U 3 4 5
0005	Written exam part 2	2.3	G U 3 4 5

Last revised

Kursplanen är fastställd av Institutionen för Tillämpad kemi och geovetenskap 2008-12-15 att gälla från H09.

Syllabus established

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