COURSE DETAIL

EARTH SCIENCE DYNAMICS, CYCLES, AND TIMESCALES
Country Netherlands
Host Institution Leiden University College
Program(s) Leiden University College
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Earth & Space Sciences
UCEAP Course Number 103
UCEAP Course Suffix
UCEAP Official Title Earth Science Dynamics, Cycles, and Timescales
UCEAP Transcript Title EARTH SCI DYNAMICS
UCEAP Quarter Units 4.50
UCEAP Semester Units 3.00

Course Description

This course aims to explore the theme of Earth processes and in particular to address the chemistry and physics based actors in System Earth. This course explores the principal components of System Earth: plate tectonic theory; rocks, water, and weathering; and time scales of System Earth. By going through a selection of calculated examples a deeper understanding of the processes involved is obtained. The course focuses first on the dynamics of planet Earth, the principal building blocks of the solid Earth, and introduces plate tectonic theory as the underlying paradigm; time scales and rates of processes are introduced. The second part of the course first studies carbonate dissolution and the role of atmospheric CO2 on the pH of natural waters. In the next step the course introduces the anthropogenic factor: the chemical reactions that contribute to the formation of acid rain, and the course proceeds to quantify the effect of acid rain on natural waters. Thermodynamics gives us the tools to quantify chemical reactions. Weathering reactions of basement rock in the acidic environments forms clay minerals. The process of clay mineral formation in turn can be linked to the formation of mineral resources such as bauxite. The final leg of the course introduces isotope geochemistry and its role in quantifying Earth processes: radioactive decay as a tool to measure time and isotope fractionation as a tool to document temperature fluctuations, and thus climate change in the past.

Language(s) of Instruction
English

Host Institution Course Number
4503EES01

Host Institution Course Title
EARTH SCIENCE DYNAMICS, CYCLES, AND TIMESCALES

Host Institution Course Details
https://studiegids.universiteitleiden.nl/en/courses/110216/earth-science-dynami...

Host Institution Campus Leiden University College, The Hague
Host Institution Faculty
Host Institution Degree
Host Institution Department Earth, Energy & Sustainability
Course Last Reviewed 2021-2022

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