

*Course syllabus*

# Atmosfärskemi och -fysik Atmospheric Chemistry and Physics

## FKFF05, 5 credits, G2 (First Cycle)

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED N

**Date of Decision:** 2023-04-17

## General Information

**Main field:** Technology.

**Compulsory for:** W2

**Elective for:** F4, F4-es

**Language of instruction:** The course will be given in English

## Aim

The course should provide understanding of physical, chemical and meteorological processes in the atmosphere as well as environmental consequences of changes of atmospheric composition caused by human activities, such as climate change, air pollution and destruction of stratospheric ozone. The course should also provide a capability to assess and discuss environmental issues within the working life and societal debate from a natural science perspective.

## Learning outcomes

### *Knowledge and understanding*

For a passing grade the student must

- know how to undertake physical and chemical calculations for the atmosphere based on presented methodology and modelling tools, such as meteorological box models and simple climate models, and to interpret the results in atmospheric and environmental perspectives
- be able to describe and understand the role of atmospheric processes in important environmental issues from a natural science perspective
- know how to explain qualitatively and in some cases quantitatively the impact of human activities on the atmosphere, and in a wider perspective, the conditions for life.

### *Competences and skills*

For a passing grade the student must

- acquire knowledge to integrate material on the atmosphere from several disciplines
- acquire knowledge to integrate material from text books and simpler scientific literature
- carry out project work and plan a presentation
- be able to present a project and discuss their results.

## Contents

Atmospheric composition and thermodynamical properties, meteorology, meteorological models, geochemical cycles, climate, aerosol, chemical kinetics, stratospheric ozone, oxidising power of the atmosphere, air pollution and acid rain.

## Examination details

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** The examination consists of a written exam and a project. It is also possible to write a test, which can generate extra credits on the exam.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

### Parts

**Code:** 0118. **Name:** Project.

**Credits:** 1. **Grading scale:** UG. **Assessment:** Examination of oral presentation

**Code:** 0218. **Name:** Written Examination.

**Credits:** 4. **Grading scale:** TH. **Assessment:** Written exam

## Admission

**Assumed prior knowledge:** FMAA05 Calculus in One Variable.

**The number of participants is limited to:** No

**The course overlaps following course/s:** FKFF01

## Reading list

- Jacob, D.J.: Introduction to Atmospheric Chemistry.
- Princeton University Press 1999. ISBN: 0-691-00185-5.
- Additional material handed out during the course.

## Contact and other information

**Course coordinator:** Johan Friberg, johan.friberg@nuclear.lu.se

**Course coordinator:** Pontus Roldin, pontus.roldin@nuclear.lu.se

**Course homepage:**

[http://www.nuclear.lu.se/utbildning/obligatoriska\\_kurser/atmospheric\\_chemistry\\_and\\_physics/](http://www.nuclear.lu.se/utbildning/obligatoriska_kurser/atmospheric_chemistry_and_physics/)

**Further information:** It is mandatory to attend the first lecture in order to be admitted to the course.