Course syllabus

Effects of Air Pollution on Climate, Health and Green Transition - Addressing Complex Issues at the Interface of Technology and Medicine
Luftföroreningars påverkan på klimat, hälsa och den gröna omställningen - hur samspelet mellan teknik och medicin löser komplexa frågor

TFRE80, 4.0 credits, G1 (First Cycle)

Valid for: 2026/27
Faculty: Faculty of Engineering LTH
Decided by: PLED C/D
Date of Decision: 2026-02-12
Effective: 2026-03-16

General Information

Depth of study relative to the degree requirements: First cycle, has only upper-secondary level entry requirements
Language of instruction: The course will be given in English

Aim

The aim of the course is to provide:

- fundamental knowledge on air pollution and its effects on health and climate.

- fundamental understanding of the interactions between engineering sciences and medicine to identify and mitigate poor air quality.
- basic comprehension of how society works towards improving air quality, e.g. how policy work is conducted.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be able to explain general sources of air pollution, locally and globally, and their effects on climate and health.
- be able to explain how our transition towards greener energy sources, and our strive towards circularity, can affect our air quality and what risks this may entail.
- be able to explain how health effects of air pollution are studied on cell-, organism-, and population level.
- be able to explain how health limit values, policies and legislation are generated.

Competences and skills
For a passing grade the student must

- with respect to health risks and from an air pollution perspective, be able to argue the advantages and disadvantages of the green transition and circularity.
- with respect to climate effects and from an air pollution perspective, be able to argue the advantages and disadvantages of the green transition and circularity.
- be able to describe and argue for appropriate methods to analyze the toxicity of air pollutants and their impact on populations.
- be able to propose and justify methods to influence legislation regarding air quality

Judgement and approach
For a passing grade the student must

- be able to assess and reflect on the interaction between air pollution, health, and climate in an analytical way.

Contents

The course is divided into the following subject areas:

1. Air pollution locally and globally (definitions, basic measurement methods, sources, dispersion mechanisms)
2. Long and short term health effects of air pollution, and how these are studied
3. The green transition and how current sources of air pollution might be exchanged with new ones.
4. A circular society without the introduction of new potentially harmful air pollution sources
5. Mitigation strategies, policies, and legislation

The course consists of lectures on the subject areas listed above . Based on these subject areas, a number of seminars will be held, during which students are expected to familiarize themselves with the provided material in order to actively participate in group discussions on the issues raised by the material. After each seminar, students will hand in individually brief reflections on the outcomes of the discussions .The course concludes with an

interactive workshop on policy. The course will also offer a study visit to the Aerosol Laboratory.

Examination details

Grading scale: UG - (U, G) - (Fail, Pass)
Assessment:

To pass, active attendance at at least 5 out of the course's 6 lectures, active participation in workshops and seminars, as well as approved written reflections are required.

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.

Modules
Code: 0125. **Name:** Effects of Air Pollution on Climate, Health and Green Transition.
Credits: 4.0. **Grading scale:** UG - (U, G). **Assessment:** To pass, active attendance at at least 5 out of the course's 6 lectures, active participation in workshops and seminars, as well as approved written reflections are required. **The module includes:** 1. Air pollution locally and globally (definitions, basic measurement methods, sources, dispersion mechanisms) 2. Long and short term health effects of air pollution, and how these are studied 3. The green transition and how current sources of air pollution might be exchanged with new ones. 4. A circular society without the introduction of new potentially harmful air pollution sources 5. Mitigation strategies, policies, and legislation **Further information:** The course consists of lectures on the subject areas listed above . Based on these subject areas, a number of seminars will be held, during which students are expected to familiarize themselves with the provided material in order to actively participate in group discussions on the issues raised by the material. After each seminar, students will hand in individually brief reflections on the outcomes of the discussions .The course concludes with an interactive workshop on policy. The course will also offer a study visit to the Aerosol Laboratory.

Admission

The number of participants is limited to: No

Reading list

- Material consisting of scientific articles and other reference literature, not exceeding 300 pages. All material will be available through the course Canvas page.

Contact

Course coordinator: Christina Isaxon, christina.isaxon@design.lth.se

Further information

The course will have a Canvas webb page.