



Course syllabus

Miljömätteknik Methods for Environmental Monitoring

FKFN35, 7,5 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED F/Pi

Date of Decision: 2023-04-18

General Information

Elective for: E4, F4, W4-ms

Language of instruction: The course will be given in English

Aim

The course aims at providing an understanding of advanced environmental measurement techniques for air quality applications, and how these techniques can be used to provide a scientifically sound basis for estimates of the impact of various human activities on the environment and human health.

The course also aims at stimulating the student to reflect on how our common-day human activities may affect the environment and human health, and at acquiring 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

- have acquired the capability to describe and understand various environmental problems with an emphasis on air quality related issues from a natural science perspective,
- be able to formulate problems aiming at clarifying risks to the environment and human health related to air quality issues,
- be able to plan an environmental investigation based on the problems formulated, and select the most suitable measurement techniques,

- have acquired the capability to conduct a preliminary evaluation of the acquired environmental data aiming at clarifying the problems formulated.

Competences and skills

For a passing grade the student must

- be able to integrate knowledge regarding environmental measurement techniques and problems relating to air quality issues,
- have acquired the capability to present the results from their project work and to discuss the results with the course teachers and students during an oral presentation,
- be able to carry out a project to solve an environmental question/issue and plan the presentation within the given framework,
- be able to integrate knowledge from an extensive material or project work in order to provide solutions to environmental problems,
- be able to present the results obtained from the data evaluation both in writing and orally.

Judgement and approach

For a passing grade the student must

- have been stimulated to reflect further on how our common-day human activities may affect the environment and human health.

Contents

General air quality problems and their environmental and health effects are presented. Discussion of various measurement scenarios. Multiphase processes in air pollution studies. Physical and chemical processes associated with air pollution. Measurement and analytical methods based on physical and chemical characterisation of air pollutants. A project dealing with evaluation of environmental measurement data. Laboratory exercise and demonstrations where high technology research equipment is used or demonstrated.

Examination details

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

Assessment: The examination consists of two parts, one written exam in which the student individually answers questions, mostly of a descriptive character, and a project work in a small group. To pass, the student must also take active part in the compulsory laboratory exercise, and have the written laboratory report approved. The grade is based on the written exam and the project work. The final grade is weighted by 75 % by the written exam and 25 % by the project work. It is mandatory to attend the first lecture in order to be admitted to the course.

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.

Admission

Assumed prior knowledge: Basic physics. Course credits accumulated, which are corresponding roughly to a bachelor degree.

The number of participants is limited to: No

The course overlaps following course/s: FYST38, FKF100

Reading list

- Chapters from books and lecture notes compiled by the teachers.

Contact and other information

Course administrator: Adam Kristensson, adam.kristensson@nuclear.lu.se

Teacher: Mårten Spanne, marten.spanne@malmo.se

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Course homepage:

http://www.nuclear.lu.se/english/teaching/valfria_kurser/miljoemaetteknik/

Further information: The course is a collaboration between the divisions of Nuclear physics, Combustion physics, Departments of Occupational and environmental medicine and Malmö Environmental Department. It is mandatory to attend the first lecture in order to be admitted to the course.