



Faculty of Science

## **FYSA25, Physics: Environmental Physics, 15 credits**

*Fysik: Miljöfysik, 15 högskolepoäng*  
First Cycle / Grundnivå

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### **Details of approval**

The syllabus was approved by Study programmes board, Faculty of Science on 2021-06-11 to be valid from 2021-06-11, spring semester 2022.

### **General Information**

The course is a compulsory course for first-cycle studies for a Bachelor's degree in Environmental sciences and is included as an optional course in the Environment and health science programme at Lund University.

*Language of instruction:* Swedish

*Main field of studies*

Physics

Environmental Science

*Depth of study relative to the degree requirements*

G1F, First cycle, has less than 60 credits in first-cycle course/s as entry requirements

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### **Learning outcomes**

The overarching aim of the course is that the student should acquire fundamental knowledge in physics with relevance in environmental science. The student should also practice on carrying out physical experiments, present results and assess the role of physics in energy and environmental technology.

### **Knowledge and understanding**

On completion of the course, the student shall be able to:

- give an account of basic thermodynamic processes and applications of these
- describe important phenomena in the physics of waves
- explain what sound and noise is and describe how to protect oneself from noise
- give an account of different types of ionising radiation, with special focus on interactions in matter

- give an account of important physical processes in the atmosphere with importance for the earth's climate
- describe the occurrence of magnetic fields in our environment and give a general account of their origin and for the connections between these and electric currents.

### **Competence and skills**

On completion of the course, the student shall be able to:

- plan and carry out simple physical experiments
- evaluate and present results of experiments, including making clear figures
- carry out simple calculations and estimates of magnitude in relevant fields of environmental physics
- search for and present information orally from scientific sources as well as from public authorities and companies.

### **Judgement and approach**

On completion of the course, the student shall be able to:

- demonstrate an understanding of the role of physics in society, especially with regards to energy and environmental technology
- demonstrate an understanding of the risks of ionising and non-ionising radiation
- critically discuss the possibilities of current and future technologies, limitations and risks
- critically review information on environmental physics in e.g. mass media
- reflect on progress in terms of knowledge and competence based on the course goals and own goals.

### **Course content**

The course includes a basic overview of areas within physics as well as applications of physics within the environmental area.

Energy and thermodynamics are treated in detail to create an understanding of the principles of energy transformation, energy flows and energy use. The course also includes an atmospheric physics-based understanding of mixing and transport in the atmosphere, the radiation balance of the earth, and climate changes. The wave physics part includes concepts such as interference, resonance, noise and noise cancellation, and their effect on environment/working environment. The origin of magnetic fields and physiological risks are brought up. The course also covers the atomic and molecular physics foundations of measurement techniques in the environmental area. The ionising and non-ionizing radiation part treats the origins of alpha, beta and photon radiation, and their properties, detection and physiological effects.

During the course, connections are made to current issues concerning the role of physics in the environmental area and in society.

The course also provides students with an awareness of and use of tools for the collection, processing and presentation of physics data.

### **Course design**

The teaching consists of teaching sessions, group tuition, seminars and supervision in connection with laboratory sessions. Participation in seminars and the laboratory

sessions are compulsory.

## Assessment

Examination takes place in writing in the form of an examination at the end of the course and through written laboratory reports during the course, and through active participation in compulsory components. The compulsory components consist of seminars and submission of individual reflection around own learning.

Students who do not pass a regular assessment will be offered another opportunity for assessment soon thereafter. Course components that are not completed - compulsory components and presentations - can be compensated for following an agreement with the lecturer/s and the director of studies.

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.

*Subcourses that are part of this course can be found in an appendix at the end of this document.*

## Grades

Marking scale: Fail, Pass, Pass with distinction.

To pass the whole course requires approved written examination, approved laboratory reports, approved participation in seminars, and submitted individual reflection around the student's own learning.

The grading scale for written examination and laboratory sessions are Fail, Pass and Pass with distinction. The grading scale for participation in seminars and submitted individual reflection are Fail, Pass.

The final grade is decided through a weighting of the results of the examination (1/3) and the written assignments (2/3).

## Entry requirements

Admission to the course requires knowledge equivalent to MVEA10 Environmental sciences: Basic course, 15 credits.

## Further information

The course cannot be included in qualification together with FYSA15 Environmental Physics 15 credits.

## Subcourses in FYSA25, Physics: Environmental Physics

Applies from V22

- 2201 Written Exam, 7,5 hp  
Grading scale: Fail, Pass, Pass with distinction
- 2202 Laboratory Workshops, 6,0 hp  
Grading scale: Fail, Pass, Pass with distinction  
A Pass grade requires that the student comes well prepared to the laboratory sessions, participates actively in them, and passed written laboratory reports.
- 2203 Seminars, 1,5 hp  
Grading scale: Fail, Pass  
A Pass grade requires active participation in the compulsory seminars and submission of individual reflection around the student's own learning.