



LUND
UNIVERSITY

Faculty of Social Sciences

MESB02, Earth Systems Science, 7.5 credits

Biogeovetenskap, 7,5 högskolepoäng

First Cycle / Grundnivå

Details of approval

The syllabus was approved by The Board of the Lund University Centre for Sustainability Studies on 2021-09-02 to be valid from 2022-08-24, autumn semester 2022.

General Information

The course is a first term compulsory course within Lund University Master's Programme in Environmental Studies and Sustainability Science (LUMES).

Language of instruction: English

Main field of studies

Environmental Studies and Sustainability Science

Depth of study relative to the degree requirements

G2F, First cycle, has at least 60 credits in first-cycle course/s as entry requirements

Learning outcomes

Upon the completion of the course, the student shall

Knowledge and understanding

- describe the structure and function of the Earth system, including its physical, chemical, and biological subsystems.
- identify and describe the drivers and long-term trends underpinning current global sustainability challenges such as climate change, biodiversity loss, changes in land use and shortage of freshwater.
- demonstrate knowledge of the scientific research process, including problem formulation, analytical reasoning, experimental design, data collection and analysis.

Competence and skills

- demonstrate the ability to analyse the interconnected structure and function of the Earth system from the local to the global level.
- demonstrate the ability to analyse the drivers underlying global climate and environmental change.
- formulate research questions for experimental design, data collection and analysis.
- develop skills in academic writing, the independent use of academic libraries and resources, including bibliographic databases, to critically evaluate, process and compile scientific information and data.
- constructively and respectfully engage in group work to successfully complete defined tasks.
- develop skills in communication and the ability to present orally and in writing.
- demonstrate active participation and leadership skills in respectful and results-oriented group work settings in a multi-cultural study environment.

Judgement and approach

- use a scientific approach to explain changes in the Earth system including its physical, chemical, and biological subsystems.
- demonstrate the ability to devise a scientifically grounded approach to the description and analysis of human drivers underlying global climate and environmental change.
- demonstrate the ability to re-examine and reframe the definition and solution of a scientific problem.

Course content

The course provides knowledge of the biophysical components and overall function of the Earth system in relation to global climate and environmental change. The course covers the following key issues within Earth Systems Science:

- terrestrial and marine ecosystem structure and function
- biodiversity and biodiversity loss
- changes in land use, including forests and agriculture
- overview of bio-geo-chemical cycles for phosphorous, carbon, nitrogen and water
- Earth's physical climate system and anthropogenic climate change
- causes and ecological consequences of global environmental change

Course design

The course consists of lectures, seminars and exercises. Individual and group-based exercises and assignments are combined to stimulate and evaluate the students' ability to identify, understand and analyse the causes, drivers and consequences of global environmental change. Theoretical knowledge introduced in the course is applied to concrete empirical cases selected by the student for the written group take-home exam and the written individual take-home exam.

Compulsory components

Unless there are valid reasons to the contrary, compulsory participation is required in the oral presentation of the individual written take-home exam and in the oral

presentation of the written group take-home exam. Students who have been unable to participate due to circumstances such as accidents or sudden illness will be offered the opportunity to compensate for or re-take compulsory components. This also applies to students who have been absent because of duties as an elected student representative.

Assessment

Course assessment is based on:

- Written individual take-home exam (3 credits)
- Written group take-home exam (4,5 credits)

To receive a passing grade on the course the student must also have participated in the compulsory components:

- Oral presentation of the written individual take-home exam
- Oral presentation of the written group take-home exam

The course includes opportunities for assessment at a first examination, a re-sit close to the first examination and a second re-sit for courses that have ended during that school year. Two further re-examinations on the same course content are offered within a year of the end of the course. After this, further re-examination opportunities are offered but in accordance with the current course syllabus.

A student who has taken two examinations in a course or a part of a course without obtaining a pass grade is entitled to the nomination of another examiner, unless there are special reasons to the contrary.

Students getting a passing grade cannot re-take an exam or re-submit a paper to get a higher grade.

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.

Grades

Marking scale: Fail, Three, Four, Five.

The compulsory components are exempted from the grading scale above. The grade awarded for these components is Pass or Fail. For the grade of Pass, the student must show acceptable results. For the grade of Fail, the student must have shown unacceptable results.

The highest grade for the course is Five and the lowest grade for passing is Three. Grades for a non-passing result is Fail. The student's results are assessed with reference to learning outcomes of the course. For grade Five, the student must show an excellent result in all learning outcomes. For the grade Four, the student must show a very good result in all learning outcomes. For the grade Three, the student must show a sufficiently good result in all learning outcomes. The grade Fail means that the student has not reached the learning outcomes of the course.

At the start of the course, students are informed about the learning outcomes stated in the syllabus and the grading scale and how it is applied on the course.

Overall course grade:

The grade for the entire course consists of the average grade of the two exams that are assessed according to the Fail-5-4-3 grading scale. The written individual take-home exam is worth 40% of the final grade. The written group take-home exam is worth 60% of the final grade. For a grade of 3 on the entire course the student must have been awarded at least 3 on both exams. The student must also have participated in all compulsory components to pass the course.

Exam	Credits	Grades	Part of the final grade for the course
Written individual take-home exam	3	Fail-3-4-5	40%
Written group take-home exam	4,5	Fail-3-4-5	60%
Oral presentation of written individual take-home exam (compulsory component 1)	0	Fail-Pass	0
Oral presentation of written group take-home exam (compulsory component 2)	0	Fail-Pass	0
	7,5		100%

Example: The student got the grade grade of 3 on the written individual take-home exam and the grade of 5 on the written group take-home exam (and the grade Pass on the two compulsory components). The final grade is $4 ((3 * 40) + (5 * 60)) / 100 = 4,2$

Entry requirements

To be admitted to the course, the student must hold a Bachelor's degree, including at least 180 ECTS.

A good command of spoken and written English, equivalent to English 6/B (advanced) proficiency in the Swedish secondary system, is required. Equivalent assessments will be made according to national guidelines.

Further information

The course cannot be included in a degree together with MESB01 Earth Systems Science, 10 credits.