



Department of Earth and Environmental Sciences

MVES03, Environmental Science: A Circular and Biobased Society, 15 credits

Miljövetenskap: Ett cirkulärt och biobaserat samhälle, 15 högskolepoäng
Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2019-06-10. The syllabus comes into effect 2019-06-10 and is valid from the spring semester 2020.

General information

The course is an elective course for a degree of Master of Science in Environmental Science, Environment Health Science and Applied Climate Strategy.

Language of instruction: Swedish

Main field of study *Specialisation*

Environmental Science A1F, Second cycle, has second-cycle course/s as entry requirements

Learning outcomes

The overall aim of the course is that the students should acquire knowledge about the relationship between sustainable land use and a circular and biobased society, focusing on measures for decreased emission of greenhouse gases and sustainable use of resources, material and land. The course deepens the students' understanding of the flow of terrestrial resources, nationally and globally, and the natural and social processes that control these. The course includes studies of different tools for analysis of potential environmental, social and economic effects of an alternative resource use, land use and control logic, with focus on a circular biobased economy and its links to sustainable land use.

Knowledge and understanding

On completion of the course the students shall be able to:

- explain the central principles of a circular biobased society, with focus on sustainable land use.
- account for opportunities and limitations with a circular biobased society, aiming for long-term sustainability, where measures for decreased emission of greenhouse gases and sustainable resource use and land use are central.
- explain the principles of different tools to evaluate environmental, social and economic effects of circular biobased solutions.
- account for effects of a changed land use at different spatial scales (local, regional, national and global).

Competence and skills

On completion of the course the students shall be able to:

- plan and carry out assignments within given time frames using relevant methods, language and reference management.
- explain and analyse, orally and in writing, different opportunities and limitations regarding the development of a circular bioeconomy with focus on sustainable land use.
- compare different societal actors' potential to steer towards a circular biobased society with focus on strategic land and resource utilisation.
- discuss advantages and disadvantages of using different tools that can be applied to analyse the effect of different circular biobased solutions.
- choose and apply a correct methodology for your own analysis of the effects of a new biobased solution.
- independently acquire the knowledge required to carry out project work.

Judgement and approach

On completion of the course the students shall be able to:

- identify controversial questions, and the roles of different actors, in the area of circular bioeconomy, where measures for decreased emission of greenhouse gases and improved resource and land use are central issues.
- critically evaluate information about a biobased economy that forms the basis for decision making at different political levels.
- critically reflect on ethical aspects of land and resource utilisation in a circular biobased society, at a local, regional, national and global level.
- evaluate strengths and weaknesses with different ways a society can develop a system for a biobased society, and the resulting effects at different geographic scales.

Course content

The course consists of four parts. Three of the parts are mainly theoretical, and part four consists of case studies, where the students apply their theoretical knowledge on practical cases. The cases will vary, but aim to cover different perspectives of a circular society, and be closely linked to ongoing research at involved departments, and practice in industry and different societal actors.

Part 1 is a general introduction to challenges and risks associated with a singular, traditional economy, and the effects of implementing a circular biobased society from a system perspective. This part takes a holistic approach regarding effects on natural and societal systems.

Part 2 deals with policy and control, including rules and legislation, of a circular biobased society (e.g. public procurement, strategic landscape planning, justice aspects).

Part 3 deals with different methods to evaluate the effect of circular solutions: life-cycle analysis, systems analysis, and using scenarios and modelling as evaluation tools.

The aim of **Part 4** is that the students should work with cases, in groups or individually, and follow specific material flows, resources or problems. These practical modules connect back to the previous three modules and offer the students a way to apply their acquired knowledge. Note that even if the general focus of the practical modules is on a material or the flow of a resource, at least one of the modules will focus on the relationship between this material and other materials e.g. plastic and water consumption, bioplastic and alternative use of biomass (food, energy or alternative material).

Course design

The teaching consists of lectures, case-based seminars, workshops, written assignments, study visits and project work. Participation in seminars, written assignments, workshops, study visits and associated parts is compulsory.

Assessment

Examination takes place in writing in the form of a mini exam (dugga), a take-home examination, two group assignments and an individual assignment. Group assignments and individual assignment will also be evaluated via oral examination. For students who have not passed the regular examination, an additional examination in close connection to this is offered.

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

Grading scale includes the grades: Fail, Pass, Pass with distinction

The grades awarded for the written take-home examination and the individual assignment are Fail, Pass and Pass with distinction. The grades awarded for the quiz and the group assignments are Fail and Pass. To pass the entire course, approved quiz, individual work, group assignments, take-home examination and other compulsory parts are required. The final grade is determined by the combined assessment of the parts included in the examination.

Entry requirements

To be admitted to the course, 90 credits in science courses are required, including knowledge equivalent to MVES01 Environmental Science: Environmental Management, Sustainability and Business Value Creation, 15 credits, and MVES02 Environmental Science: Governance for a Sustainable Economy, 15 credits, or 90 credits in scientific studies, including knowledge equivalent to BIOR39 Biology: Biological Monitoring, 15 credits, or BIOC05 Biology: Nature Conservation, 15 credits.