



MJ2659 Technology and Ecosystems, Larger Course 7.5 credits

Teknik och ekosystem, större kurs

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for MJ2659 valid from Autumn 2012

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Environmental Engineering, Mechanical Engineering

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

Samhället idag är uppbyggt av olika tekniska system och processer. Kursen mål är förmedla djupare kunskaper om människans användning av naturresurser, miljöeffekter från tekniska processer, system och mänskligt beteende.

Efter genomgången kurs skall studenten kunna:

- Beskriva och förklara begreppen ekologisk bärkraft, ekosystem, och ekologiska tjänster i relation till teknisk utveckling, befolknings tillväxt, välfärd och hållbar utveckling.
- Beskriva och förklara dagens viktigaste globala miljöhot som tex global uppvärmning, försurning, eutrofiering, uttunning av ozonskiktet, miljögifter, biologisk mångfald, vattenbrist och avskogning.
- Beskriva och förklara miljöpåverkan från individens dagliga liv av konsumtion, energiförbrukning och utnyttjande av transporter.
- Beskriva och förklara förändringar och konflikter kring globala naturresurser, som tex regnskogens skövling och bristen på dricksvatten.
- Analysera på systemnivå, med ett livscykelperspektiv, miljöpåverkan från en produkt, process eller tjänst och presentera analysen i skriftlig och muntlig form på ett vetenskapligt accepterat sätt.

The whole society is built up by different technical systems and processes used in different sectors of the society. This course will provide deep knowledge about natural resources and environmental consequences from technical systems, technical processes and human behavior in society.

After passed course the student should be able to:

- Describe and explain concepts of ecological carrying capacity, ecosystems and ecological services in relation to technology development, human population growth, affluence and sustainable development.
- Describe and explain today's most important global environmental threats (substances, sources, driving forces, ecosystem impacts) as e.g. climate change, acidification, eutrophication, ozone depletion, organic pollutants, biodiversity, water supply and deforestation.
- Describe and explain environmental impact from daily life behavior connected to consumption and transports.
- Describe and explain changes and conflicts concerning global natural resources such as decreasing rainforests and lacking water resources.
- Describe and analyze environmental impacts from different forms of energy production
- Analyze environmental impact from products, processes or services with a life cycle approach and present the analysis in an oral and written report.

Course contents

- Concepts of ecological carrying capacity, ecosystems and ecological services in relation to technology development, human population growth, affluence and sustainable development.
- Today's most important global environmental threats (substances, sources, driving forces, ecosystem impacts) as e.g. climate change, acidification, eutrophication, ozone depletion, organic pollutants, biodiversity, water supply and deforestation.

- Changes and conflicts concerning global natural resources such as decreasing rainforests and lacking water resources.
- Environmental impacts from our daily life behavior.
- Environmental impacts from different forms of energy production
- Analyzing environmental impacts from products, processes or services based on life cycle thinking.
- Ecological footprint – evaluation of carrying capacity.

Specific prerequisites

At least 100 academic credits (ECTS) in a program of engineering or natural science or course MJ 2613 or corresponding knowledge including documented proficiency in English B or equivalent.

Course literature

Meddelas vid kursstart

Examination

- LIT1 - Literature Assignment, 1.0 credits, grading scale: P, F
- PRO1 - Project 1, 2.0 credits, grading scale: P, F
- PRO2 - Project 2, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.