



FMJ3387 Energy Technology and Sustainability 6.0 credits

Energiteknik och Hållbarhet

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 FMJ3387 valid from Spring 2019

Grading scale

P, F

Education cycle

Third cycle

Language of instruction

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

Intended learning outcomes

After the completion of this course, the course participants should be able to:

- Demonstrate an understanding and apply different interpretations of Sustainable Energy Development
- Understand energy's role in key sustainable development paradigms:

1. Circular economy
2. Planetary boundaries
3. Hard sustainability
4. Soft sustainability
 - Understand and map how the energy system relates to:
 1. Agenda 2030 and the Sustainable Development Goals
 2. Social sustainability
 3. Economic sustainability
 4. Environmental sustainability
 - Quantifying and mapping how energy development impacts on (and is impacted by):
 1. Land-use
 2. Water-use
 3. Climate mitigation and adaptation
 4. Socio-economy (including the macro economy, urban and rural settlements)
 - Understand sustainable development challenges to be tackled by key KTH research areas:
 1. Applied Thermodynamics and Refrigeration
 2. Heat and Power Technology
 3. Heating and Ventilation
 4. Climate Studies
 5. Systems Analysis
 6. Low carbon energy supply integration
 - To define the so called ‘Science-Policy Interface’ and understand the importance of communication to a broader public, including decision makers
 - PhD students need to point out how their research relates to sustainability paradigms and contextualise it within broader systems.

Course contents

- Defining the energy system. Global, regional, national, rural, urban, to technologies, fuels and key characteristics.
- Mapping energy systems to the SDGs. Direct, indirect impacts of and on other SDGs.
- Defining views of sustainable energy development
- Introducing Reference Resource to Service System (i.e. Mapping how resources are extracted, recycled and used to meet development needs)
- Describe selected KTH research areas and technology sustainable development challenges\
- Quantitatively define sustainable development paradigms.

Specific prerequisites

Admitted to PhD studies.

Examination

- PRO1 - Project, 6.0 credits, grading scale: P, F
- PRO2 - Project, 3.0 credits, grading scale: P, 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.

Other requirements for final grade

The students will be examined with a pass or fail criteria (P/F), based on the following:

- Draft article for popular science presenting broad sustainability implications of one's PhD project
- Evaluation of an energy policy/project in light of all SDGs' 169 Targets to analyse synergies and trade-offs between a policy/project and the broader 2030 Agenda for Sustainable Development

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.