Sustainable Energy Systems

Programme course

6 credits

Uthålliga energisystem

TMES24

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical
Engineering and Design

Date determined
2017-01-25

Main field of study

Energy and Environmental Engineering, Mechanical Engineering

Course level

First cycle

Advancement level

G2X

Course offered for

- Energy - Environment - Management, M Sc in Engineering

Entry requirements

Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Intended learning outcomes

The overall goal is to provide different aspects on renewable energy resources and to provide a systems perspective on energy supply and energy demand. After the course the student should be able to:

- Describe and understand basic energy concepts
- Describe and contextualize renewable energy and other energy supply
- Describe and understand technology regarding electricity, heating and cooling production
- Calculate electricity and heat production from some technologies
- Describe and understand technology and systems regarding distribution of district heating, district cooling and electricity
- Explain and reflect upon the importance of system boundaries for different energy systems
- Identify and analyze climatic and environmental aspects on different energy systems
- Describe and understand means of control within the energy systems area
- Describe energy use within different sectors
- Reflect regarding the design of resource-economic and persevering energy systems
- Through analysis find and assess arguments in presentations and conduct structured arguments within the area of the course
- Communicate the result of learning within the area of the course both verbally and written

Course content

Science of Energy, renewable and non-renewable energy, systems and system boundaries, energy systems globally and in Sweden, production units for heat, electricity and cooling, distribution of district heating, district cooling and electricity, biofuels for transportation, climatic influence from different energy systems, energy use within different sectors.

Teaching and working methods

Lectures, seminars, study visit

Examination

UPG3	Seminars	2.5 credits	U, G
TEN2	Written examination	3.5 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

Supplementary courses: Efficient industrial energy systems, Building energy systems, Modelling of Energy Systems, Analysis and Modelling of Industrial Energy Systems, Strategic Development of Sustainable Energy Systems, Energy, Policy Instruments, Energy Planning and Modelling of Communities, International energy markets, Project Course Advanced- Energy Engineering, Bachelor Thesis - Energy and Environment Engineering

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Shahnaz Amiri

Examiner

Maria Johansson

Course website and other links

http://www.iei.liu.se/energi/utbildning/tmes24-uthalliga-energisystem?l=sv

Education components

Preliminary scheduled hours: 34 h
Recommended self-study hours: 126 h

Course literature

IVA, Energi – möjligheter och dilemman, ISBN 978-91-7082-840-9, Edita Västra Aros, 2014 Energiläget (årlig skrift från Energimyndigheten) Skrifter från Energisystem, IEI

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.