

# Energy Systems

Programme course

6 credits

Energy Systems

TMES12

Valid from: 2017 Spring semester

**Determined by**

Board of Studies for Mechanical  
Engineering and Design

**Date determined**

2017-01-25

**Offered for the last time**

Autumn semester 2020

## Main field of study

Energy and Environmental Engineering

## Course level

Second cycle

## Advancement level

A1X

## Course offered for

- Sustainability Engineering and Management, Master's Programme

## 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.

## Prerequisites

Fluid mechanics and heat transfer, thermodynamics, electrical engineering

## Intended learning outcomes

The aim of this course is to give an understanding of energy systems from natural energy resources to the energy end use in various sectors of society. System dependencies between various sectors of society are important as are deregulations and international development of energy markets. After the course the student should:

- Have knowledge on energy systems interrelations
- Have knowledge on energy resources and sustainability
- Have knowledge on the development of international energy markets
- Understand the design of a heat and power plant
- Understand the development and design of national, regional and municipal energy systems

## Course content

Energy system definitions, interrelations between energy systems, energy use and energy supply, resources and sustainability, renewable energy, heat generation plants, solar heating, electricity generation plants, wind and wave power, combined heat and power, heat pumps, heat distribution, electricity distribution, municipal, regional and national energy systems.

## Teaching and working methods

The course is given in the form of lectures and seminars. The course also contains project work and a visit at a combined heat and power plant.

## Examination

PRA1	Project work and study visit	2 credits	U, G
TEN1	Written examination	4 credits	U, 3, 4, 5

## Grades

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

## Other information

Supplementary courses: Project course Energy, Energy in buildings, Energy systems analysis, Industrial ecology, Industrial energy systems, Integrated management systems, Impact assessment and project appraisal, International energy markets, Resource effective products.

## Department

Institutionen för ekonomisk och industriell utveckling

## Director of Studies or equivalent

Shahnaz Amiri

## Examiner

Louise Trygg

## Course website and other links

<http://www.ikp.liu.se/energi/utbildning.asp>

## Education components

Preliminary scheduled hours: 28 h

Recommended self-study hours: 132 h

## Course literature

Boyle, Godfrey (ed), Renewable Energy – power for a sustainable future (second edition), ISBN 0-19-926178 – 4, Oxford University Press, Oxford in association with the Open University, Milton Keynes 2004

## 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://stydokument.liu.se/Regelsamling/Innehall/Utbildning\\_pa\\_grund-\\_och\\_avancerad\\_niva](http://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva).