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 on energy systems interrrelations
- 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://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.