Building Energy Systems

Programme course

6 credits

Byggnaders energisystem

TMES30

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.

Prerequisites
Fluid dynamics and heat transfer

Intended learning outcomes
The aim of this course is to provide solid knowledge and computational tools for analysing buildings energy systems from a system view and give an understanding for the building as an energy system. Different kind of buildings are considered, both residential and industry buildings. A top-down approach is used in the course, starting with international view, ending in a study of the heating, ventilation and air-conditioning systems within the building. The environmental performance of buildings will be covered. After the course the students should have knowledge about the following topics:
- Indoor environmental quality (IEQ)
- Heat and mass transfer in buildings
- Heating, ventilation and air conditioning systems in buildings
- Energy supply systems
- Environmental performance of buildings Future building energy systems solutions

Course content
Energy supply and demand in the built environment, global and national point of view; Energy supply systems; Environmental impact of built environment; Indoor climate and indoor air quality; heat and mass transfer; heating, ventilation and air-conditioning systems; energy and power demand; future buildings; buildings in energy systems.

Teaching and working methods
The course is given in the form of lectures, tutorials and laboratory work.

Examination

LAB1	Laboratory work	1 credits	U, G
UPG1	Exercise	1 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: 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
Patrik Rohdin

Course website and other links

Education components
Preliminary scheduled hours: 49 h
Recommended self-study hours: 111 h

Course literature

Warfwinge och Dahlbom, 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.