

Building Energy Systems

Programme course

6 credits

Building Energy Systems

TMES17

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

Second cycle

Advancement level

A1X

Course offered for

- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering
- Mechanical Engineering, M Sc in Engineering
- 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

Energy Systems

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
TEN1	Written examination	5 credits	U, 3, 4, 5

Grades

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

Other information

Supplementary courses: Energy Systems Analysis

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: 41 h

Recommended self-study hours: 119 h

Course literature

Abel, E., Elmroth, A. (2007) Buildings and Energy - a systematic approach, Alfaprint: Formas, ISBN:978-91-540-5997-3. 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://stydokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.