Energy Planning and Modelling of Communities

Programme course

6 credits

Energiplanering och modellering av stadsdelar

TMES45

Valid from:

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined

Main field of study
Energy and Environmental Engineering, Mechanical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Energy-Environment-Management
- Mechanical Engineering, M Sc in Engineering

Prerequisites
Building Energy Systems. Modelling of energy systems.

Intended learning outcomes
The overall aim is to understand an overall perspective of energy planning when new neighborhoods are developed or renovated. The purpose of this course is to study and analyze techno-economic assessment of potential energy-saving potential for the cluster of buildings. After the course the student should be able to:

- apply methods for techno-economic assessment of potential for energy savings and energy simulation of building clusters.
- formulate long-term energy strategy for developing energy master plan of neighborhoods.
- assess whether to renovate existing buildings or construct new buildings.
- identify energy services for comprehensive energy renovation of the cluster of buildings.
- mapping of planning and decision processes
- describe interaction between the district energy systems and surrounding energy systems
- integrate the energy planning of district development and urban planning
- identify barriers and drivers as well as policies and instruments for the implementation of cost-effective energy efficiency measures.

Course content

To examine the interaction between the district energy system and the surrounding energy systems for the implementation of cost-effective energy efficiency measures. Energy efficiency strategies and energy services, innovative and highly effective combination packages of ECM for selected building clusters, business models (EPC) for renovation of neighborhoods. Decision processes as well as policies and instrument. Energy systems analysis, energy analysis of clusters of buildings and life cycle cost analysis are performed with the tools Modest, Opera and IDA respectively. An assignment that consists of several sub-tasks is also included in the course.

Teaching and working methods

The course is given in the form of lectures, seminars and simulation laboratory work.

Examination

LAB1	Simulation laboratory work	2 credits	U, G
UPG1	Written report	4 credits	U, 3, 4, 5

Grades

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

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Shahnaz Amiri

Examiner

Bahram Moshfegh

Education components

Preliminary scheduled hours: 44 h
Recommended self-study hours: 116 h

Course literature

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.