Industrial Energy Systems

Programme course

6 credits

Industriella energisystem

TMES09

Valid from: 2017 Spring semester

Determined by
Board of Studies for Industrial Engineering and Logistics

Date determined
2017-01-25

Offered for the last time
Autumn semester 2022

Main field of study
Energy and Environmental Engineering, Mechanical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Design and Product Development
- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and Management, M Sc in Engineering
- Mechanical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering, M Sc in Engineering
- Applied Physics and Electrical Engineering - International, 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
Courses in fluid mechanics and heat transfer

Intended learning outcomes

The overall aim of the course is that the student shall gain knowledge of industrial energy systems and building energy systems. knowledge on industrial energy systems and building energy systems. After the course the student will:

- describe and critically reflect on the structure and development of energy use
- describe and critically reflect on the system consequences of demand side and supply side measures
- describe and critically reflect on energy auditing methods and measures for improved energy efficiency
- describe and critically reflect on energy systems analysis methods
- describe and critically reflect on, indoor climate, space heating, ventilation and air conditioning systems
- conduct and critically evaluate an industrial energy audit
- communicate the results of their learning in the course areas, both orally and in written form

Course content

During the course, the student is trained in the ability to critically reflect and evaluate energy efficiency measures and energy use. Different areas that is covers are, e.g. industrial energy use, structure, development and environment, industrial energy use in Sweden and in the world, Industry and the deregulated energy markets, energy use structure, auditing, analysis and forecasting, unit processes and their development, energy conservation, industrial symbiosis, energy storage, load management, tools for industrial systems analysis, barriers and driving forces to industrial energy efficiency, heat transfer in buildings, heating demand in buildings, heating ventilation and air conditioning.

Teaching and working methods

The course is given in the form of lectures, tutorials, seminars and computer labs. The course also contains a project work where an industrial audit is performed in groups. The project is reported in a written report and at a seminar. The groups also criticize each other's project work.

Examination

UPG1	Project	1.5 credits	U, G
LAB1	Laboratory work	0.5 credits	U, G
TEN2	Written examinatin	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
Patrik Thollander

Course website and other links
http://www.ikp.liu.se/energi/utbildning.asp

Education components
Preliminary scheduled hours: 66 h
Recommended self-study hours: 94 h

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.