Efficient Industrial Energy Systems

Programme course

6 credits

Effektiva industriella energisystem

TMES31

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
Sustainable energy systems, Building energy systems

Intended learning outcomes
The overall aim of the course is to provide a systems perspective on energy supply and energy demand in different types of industrial systems with focus on energy efficiency. After completion of the course the student is to be able to:

- Describe, explain and illustrate overall structure and development of industrial energy use and the influence on its environment
- Describe and discuss the function of different industrial processes and their energy use
- Describe and critically use unit process categorization of energy demand
- Critically review and carry out industrial energy audits
- Describe and reflect upon different types of measures and their potentials within industrial energy systems
- Describe and reflect upon systems consequences from measures on the supply and demand side within industrial energy systems

Course content
Structure, development and environmental consequences of industrial energy use, industrial use within Sweden and globally, analysis and estimations of potentials for energy efficiency measures, unit processes, production and support processes, technology development, energy economizing, energy effectiveness, industrial clusters, energy storage, load management, fuel conversion, energy audits, energy management

Teaching and working methods
The course is given in the form of tutorials, seminars and computer lab. In connection to some learning moments there are also compulsory tasks.

Examination

UPG2	Seminar work	1 credits	U, G
UPG1	Project work	1.5 credits	U, G
TEN1	Written examination	3.5 credits	U, 3, 4, 5

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

Other information
Supplementary courses: Bachelor Thesis - Energy and Environment Engineering. Modeling of energy systems, Strategic development of sustainable energy systems, Analysis and modelling of industrial energy systems, Energy Planning and Modelling of Communities, Energy Policy Instruments , International energy markets, Project Course Advanced- Energy Engineering.

Department
Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent
Shahnaz Amiri

Examiner
Magnus Karlsson

Course website and other links
http://www.iei.liu.se/energi/utbildning/tmes31-industrial-emm/tmes31-emm-industrial?l=sv

Education components

Preliminary scheduled hours: 40 h
Recommended self-study hours: 120 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.