Industrial Ecology

Programme course

6 credits

Industriell ekologi för ökad resurseffektivitet

TKMJ35

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

Course level

First cycle

Advancement level

G2X

Course offered for

- Energy-Environment-Management M Sc in Engineering
- Industrial Engineering and Management - International, M Sc in Engineering
- Industrial Engineering and 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

Environmental Technology

Intended learning outcomes

The course aims at developing the participants' understanding of a proactive approach to the prevention of environmental impact from products, organisations and technical systems. This will be accomplished since the participant will be able to;

- evaluate environmental impact from material and energy flows in a life cycle perspective based on thermodynamics and suggest improvements with the awareness of the risk for problem shifting
- apply material strategies such as dematerialisation, substitution and waste hierarchies regarding different products

- describe the usability of different tools and strategies for optimising material and energy flows in a life cycle perspective
- describe and use life cycle assessment to quantify environmental impacts from a system,
- search and analyse information regarding a societal environmental problem, propose realistic system approches for increased resource efficiency and present the results both orally and in written form.

Course content

- Material strategies with special emphasis on waste and recycling: Waste management in practice, Waste hierarchy, Reuse, Material and Energy recycling, Land-fills, Urban and Land-fill mining, Resource dissipation, Exergy and entropy, Dematerialisation, Transmaterialisation, Material and substance selection, Service-life, Use of by-products, Producers' responsibility
- Tools and concepts for environmental systems analysis with special emphasis on material flow analyses: Problem shifting – tool selection, Material flow analyses, Total material requirement, Direct material input, Material intensity per service, Ecological rucksacks, Ecological footprint, Substance flow analyses, Life-cycle assessments
- Urban and landfill mining, waste hierarcies, exergy and entrophy
- Business dimensions and insights into the conditions for a company in the recycling business

Teaching and working methods

Lectures, guest lectures, literature seminars and different forms of group exercises

Examination

UPG1	Assignments	U, G	2 credits
TEN1	Written examination	U, 3, 4, 5	4 credits

Active involvement in group exercises

Grades

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

Department

Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent

Niclas Svensson

Examiner

Niclas Svensson

Course website and other links

Education components

Preliminär schemalagd tid: 48 h
Rekommenderad självstudietid: 112 h

Course literature

Vetenskapliga artiklar och rapporter

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.