Materials Selection and Optimization

Programme course

6 credits

Hållbara materialval

TMKM16

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, Product Development, Mechanical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Mechanical Engineering, B Sc in Engineering
- Design and Product Development
- Energy-Environment-Management
- 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
Engineering Materials, Solid Mechanics

Intended learning outcomes
To familiarise the student with knowledge and procedures for optimisation of materials for engineering applications. After completed course the student should:
- Understand the interaction between; design, process and material
- Be able to use materials selction as a tool in the design process.
- Be able to perform materials selection according to the models presented in the course, with or without taking shape into consoderation.
- Be able to use computerized methods to carry out material optimization.

Course content
Application of material properties in engineering design; Basic theories regarding materials selection and optimisation; material design; Competition between different classes of materials; Systematic materials selection; Criteria for the use of advanced materials; Project work with the help of material database.

Teaching and working methods
Lectures, tutorials and project work

Examination

UPG1	Project assignment	2 credits	U, G
LAB1	Laboratory work	1 credits	U, G
TEN1	Written examination	3 credits	U, 3, 4, 5

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

Course literature
Materials and the Environment: Eco-informed Material Choice - 2nd ed. av Michael F. Ashby, ISBN 978-0-12-385971-6, Elsevier.

Other information
Supplementary courses: Deformation and fracture, New materials, Light materials

Department
Institutionen för ekonomisk och industriell utveckling

Director of Studies or equivalent
Mikael Segersäll

Examiner
Mattias Calmunger

Course website and other links
http://www.iei.liu.se/kmt/education/undergraduatecourses-tmkm02

Education components
Preliminary scheduled hours: 36 h
Recommended self-study hours: 124 h

Course literature

Additional literature

Books

Michael F Ashby, *Materials selection in mechanical design*

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.