Engineering Materials - New Materials

Programme course

6 credits

Konstruktionsmaterial - nya material

TMKM40

Valid from:

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined

Offered for the last time
Spring semester 2019

Replaced by
TMKO01

Main field of study
Mechanical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Mechanical Engineering, M Sc in Engineering
- Energy-Environment-Management
- Mechanical Engineering, Master's programme

Prerequisites
Basic course in Materials science and engineering.

Intended learning outcomes
The course gives an overview of recent trends and development of new engineering materials and processes with an industrial perspective. With the emphasis on powder metallurgical materials and advanced engineering ceramics, advanced surface coatings and some other new materials and processes are also introduced. After the course the students are expected to:
- Understand the fundamentals of powder metallurgy
- Understand the fundamentals of modern ceramic engineering
- Have general knowledge of high temperature coatings and some other advanced materials and material processes presented in the course

Course content
- Advantages and limitations of powder metallurgy
- Powder manufacturing and characterization
- Compacting and sintering of powder metallurgical materials
- Microstructure, properties, process and application areas of advanced ceramics
- Design approachs for ceramic components
- Introduction to high temperature coatings and thin films
- Brief overview of other selected examples of new advanced engineering and functional materials

Teaching and working methods
Teaching is in the form of lectures, seminars and laboratory work.

Examination

LAB1	Laboratory Work	1.5 credits	U, G
TEN1	Examination	4.5 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
Mikael Segersäll

Examiner
Ru Lin Peng

Course website and other links
http://www.iei.liu.se/kmt/education/undergraduatecourses-tmkm40

Education components
Preliminary scheduled hours: 52 h
Recommended self-study hours: 108 h

Course literature
German, "Powder Metallurgy Science"