

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"

