Polymer Materials

Programme course

6 credits

Polymera material

TMKM17

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined
2017-01-25

Offered for the last time
Spring semester 2022

Replaced by
TMKO06

Main field of study
Product Development, Mechanical Engineering

Course level
Second cycle

Advancement level
A1X

Course offered for
- Design and Product Development
- Energy-Environment-Management
- Mechanical Engineering, M Sc in Engineering
- Mechanical Engineering, Master's Programme

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
Basic knowledge in materials science and engineering

Intended learning outcomes
The aim of this course is to present to the student the fundamental knowledge in polymer engineering, with focus on describing material structures, engineering properties and manufacturing processes. After the course the student shall:
- Be able to explain the characteristic structures and properties of the different polymer groups, important forming processes and the interrelationship between structures, properties and manufacturing.
- Be able to make conceptual material selection for polymer products from requirements on properties and process and choose manufacturing process based on production volumes, dimensions, etc.
- Have understanding for the principles in design with polymer and composite materials.

Course content
Structure of polymer materials, thermoplastics, elastomers, thermosets, composites, additives, crystallinity, thermal properties, mechanical properties, viscoelasticity, damage and fracture, design, and manufacturing.

Teaching and working methods
Lectures, tutorials, laboratory and course work.

Examination

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

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

Other information
Supplementary courses: Lightweight materials, Mechanics of light structures, Optimization of materials, Experimental evaluation of fatigue and fracture properties, Engineering materials/Solid mechanics - Case studies

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-tmkm98

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

Course literature

Additional literature

Books

N. G. McCrum, C. P. Buckley, C. B. Bucknall, *Principles of Polymer Engineering*

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.