



LTH

FACULTY OF
ENGINEERING

Course syllabus

Lätta material Light Materials

FKMN15, 7,5 credits, A (Second Cycle)

Valid for: 2019/20

Decided by: PLED M

Date of Decision: 2019-03-27

General Information

Language of instruction: The course will be given in English

Aim

The objective of the course is to introduce the students to the materials used in light constructions, e.g. light metals and composites. Focus will be on polymer matrix composites, but also the light metals Ti, Al, and Mg and other types of composites will be discussed.

Manufacturing methods, heat treatments, properties, and environmental aspects will be discussed in the course. Special focus will be on dimensioning methods for composites, especially laminate theory.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- know the most common types of Ti-, Al- and Mg alloys, how they are manufactured and heat treated, and their properties.
- know the different types of composites, and what materials are used as fibers and matrix.
- know the manufacturing methods, properties and the dimensioning methods for composites.

Competences and skills

For a passing grade the student must

- be able to do a material selection for light constructions.
- be able to dimension a composite laminate with respect to stiffness and strength.

Judgement and approach

For a passing grade the student must

be able to analyze cons and pros of a material selection with respect to properties, manufacturing methods, and environmental considerations.

Contents

Light alloys: aluminum, titanium, magnesium. Types of alloys, manufacturing, heat treatment, properties, use, recycling.

Composites: Types, fibers, matrixes, manufacturing, dimensioning, laminate theory, properties, use, environmental aspects.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: Written exam. Written report on composite dimensioning and laborations.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

Required prior knowledge: Materials Engineering, Basic Course and/or Advanced Materials Technology and Linear Algebra, Calculus in One Variable, Thermodynamics and Fluid Mechanics and a course in Physics.

The number of participants is limited to: No

The course overlaps following course/s: MMT175

Reading list

- D. Hull och T.W. Clyne: "An Introduction to Composite Materials, Second Edition".

Contact and other information

Course coordinator: Professor Dmytro Orlov,
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Course coordinator: Professor Srinivasan Iyengar,
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Course administrator: Rose-Marie Hermansson, rose-
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Course homepage: <http://www.material.lth.se>

Further information: The course will be taught during the Spring Term (3rd quarter, January-March) every alternate year (2021, 2023 ...).