Linnæus University

Jnr: 2019/2467-3.1.2.2

Course syllabus

Faculty of Technology
Department of Mechanical Engineering

2MT020 Val av material och tillverkningsmetoder, 7,5 högskolepoäng
Selection of Materials and Manufacturing Methods, 7.5 credits

Main field of study
Mechanical Engineering

Subject Group
Mechanical Engineering

Level of classification
First Level

Progression
G2F

Date of Ratification
Approved 2010-03-03
Revised 2019-08-12 by Faculty of Technology. Change of examination.
The course syllabus is valid from spring semester 2020

Prerequisites
General admission requirements and courses Manufacturing Techniques, Solid Mechanics, Engineering materials or equivalent.

Objectives

This course is for students to carry out a systematic process where materials function, manufacturing, technological and environmental aspects are considered. The student will also acquire advanced knowledge of the relationships between construction materials structure, properties and applications.

After the course, students will:

- be able to account for a cohesive design process, where the choice of shape, material and manufacturing method interact,
- be able to structure a material selection problem by defining the function, goals and constraints,
- optimize the selection process through the derivation and formulation of the material index,
- discuss environmental impact of the various phases of a product's life cycle and use a strategy for environmentally-friendly material in a concrete material selection problems,
- have ability to identify and assimilate an additional requirement of knowledge in selected areas of material and method selection.

Content
The course includes the following elements:

- Definitions and terminology,
- Design and its process,
- Material properties and service life,
- Methodology for material selection and choice of manufacturing in the product development process,
- Materials physical and other properties in different environments, and the material's impact on the environment,
- Environment-driven product development and material selection.

Type of Instruction
Lectures and seminars on material selection methodology for industrial applications with regard to the requirements of the design, construction, and environmental impacts.

The course also includes a material project carried out and supervised in a group and presented both orally and in writing.

Certain elements may be mandatory. The scope of the compulsory elements provided by the examiner at the start of the course.

Examination
The course is assessed with the grades U, 3, 4 or 5.
The examination consists of oral literature reporting Concept Design choice of materials and manufacturing methods, and oral and written presentation of a material project. Project contains two parts: a) Product technical specifications are based on current scientific articles and b) manufacturing techniques, and the begräsningar.För passing grade the student must pass in all components.

Order to pass the course objectives to be achieved.

Repeat examination is offered in accordance with Local regulations for courses and examination at the first and second-cycle level at Linnaeus University.

If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customized exam or to have the student conduct the exam in an alternative way.

Course Evaluation
During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of the course. The course evaluation is to be carried out anonymously.

Required Reading and Additional Study Material
Compulsary Litterature
Ashby Michael F, Material Selection in Mechanical Design, Butterworth Heinemann Oxford 2010, ISBN 9781856176637, Senaste upplagan. 660 pages.

Rask Ingvar och Sunnersjö Staffan, Konceptkonstruktion – val av material och tillverkningsmetoder, Ivf, institutionen för verkstadsteknisk forskning (IVF skrift 97859). ISBN 9189158083. Karlebo handbok pages. 170.

Reference Books
K. Berggren m. fl., *Konstruera i plast*, Sveriges Verkstadsindustrier, ISBN 9175484625, Industrilitteratur AB, 2002.

Mikael Rigdahl, Antal Boldizar, Carl Klason och Josef Kubát, *Plaster - Materialval och materialdata*, ISBN 9789147020638, Liber, 2008.