



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 2014-09-09 by Faculty of Technology. Review of objectives, contents, literature and course structure.

The course syllabus is valid from spring semester 2015

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.

Course Evaluation

A course evaluation will be carried out and compiled after the course is completed. The compilation will be presented to the current board as well as to the students and filed.

Required Reading and Additional Study Material

Compulsary Litterature

Ashby Michael F, *Material Selection in Mechanical Design*, Butterworth Heinemann Oxford 2010, ISBN 9781856176637, Senaste upplagan.

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.