



COURSE SYLLABUS

Materials and Design, 6 credits

Material och design, 6 högskolepoäng

Course Code: TMDR26	Education Cycle: Second-cycle level
Confirmed by: Dean Mar 1, 2016	Disciplinary domain: Technology (95%) and social sciences (5%)
Valid From: Aug 1, 2016	Subject group: MA2
Version: 1	Specialised in: A1N
Reg number: JTH 2015/3086-313	Main field of study: Product Development

Intended Learning Outcomes (ILO)

After completing the course, the student shall

Knowledge and understanding

- demonstrate knowledge about methods and strategies to perform different materials selection tasks
- demonstrate understanding of the material properties that are important in the design/dimensioning of products.

Skills and abilities

- demonstrate ability to communicate issues regarding materials with different groups such as experts, suppliers, customers and users
- demonstrate ability to use different strategies to perform suitable materials selection

Judgement and approach

- demonstrate insights about different materials and their influence on both humans and environment

Contents

An important part of the product development process is about selecting a suitable material. A large part of the course is therefore intended to give deeper skills in materials selection and knowledge about the methods needed to choose the most optimal material for a specific product or component. To do this, a thorough understanding about the demands a product and its application is imposing on the materials properties is needed. In the course, not only mechanical and physical material properties are treated but also tactile and visual properties. Product design and how the product will be manufactured also influence the materials selection, and therefore design tools are introduced. The course also includes discussions on how the choice of materials affect the environment from a sustainability perspective.

The course includes the following topics:

- Repetition of materials and their properties

- How to use diagrams/charts to present materials selection
- Development of instructions for materials selection
- How to use software in the materials selection process
- Surfaces, surface finish and colors
- Environmentally conscious materials selection
- Influence of product design on materials selection and introduction to design tools such as DFM, DFA, and DFD
- Case studies from industry

Type of instruction

Lectures/exercises and hands-on software training. Project work as well as self-studies. Literature studies can also be included.

The teaching is conducted in English.

Prerequisites

The applicant must hold the minimum of a bachelor's degree (ie. the equivalent of 180 ECTS credits at an accredited university) with at least 90 credits within the major subject Mechanical Engineering, and 15 credits Mathematics, or equivalent. Proof of English proficiency is required.

Examination and grades

The course is graded 5,4,3 or Fail.

Registration of examination:

Name of the Test	Value	Grading
Examination ¹	3 credits	5/4/3/U
Project work	3 credits	5/4/3/U

¹ Determines the final grade of the course, which is issued only when all course units have been passed.

Other information

Exemption from entry requirement allowed according to the selection groups of the program, where the course is included.

Course literature

Literature

The literature is preliminary until one month before the course starts.

Title: Materials Selection in Mechanical Design

Author: Ashby, Michael F

Publisher: Elsevier Science & Thchnology, Oxford, UK 2004

ISBN: 9780750661683