



Course syllabus

Byggmaterialvetenskap Building Material Science

VBMF05, 7,5 credits, G2 (First Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED V

Date of Decision: 2023-03-21

General Information

Main field: Technology.

Elective Compulsory for: V3

Language of instruction: The course will be given in Swedish

Aim

The objective is to give the student a deeper understanding of the relationships between the structure of materials and their properties, and the physical, chemical and biological processes that take place in materials.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- understand how properties of materials depend on the composition and structure of materials.
- understand how processes in materials change their properties.
- understand that a deeper understanding of materials is based on a knowledge of physics, chemistry and biology.
- have deepened knowledge on how material properties are estimated from their composition and structure.

Competences and skills

For a passing grade the student must

- be able to use models for predicting material properties and performance of materials
- be able to use this knowledge in advanced applications and to generalize it to completely new applications, including applications outside the field of buildings and structures.

Judgement and approach

For a passing grade the student must

- have obtained a clear picture of what knowledge is required to assess properties and performance of new materials or current materials in new applications.
- realize that it is important to take processes in materials into account
- understand that material science is based on physics, chemistry and biology.
- realize the importance of the performance of materials in the long-term perspective that production and maintenance of buildings and structures require.

Contents

In our first course a broad survey of building materials and their properties is given. In this advanced course we will choose a limited number of topics and enter deeply into these. These are topics of importance to an engineer in the building sector and at the same time subjects that will lead to an increased conceptual understanding of material science and that this is based on physics, chemistry and biology.

Examples of subjects that will be discussed are the structure of materials, modelling of composite materials, moisture in materials and material mechanics. The subjects change somewhat from one year to another.

Five compulsory laborations are an important part of the course and are strongly connected to the lectures. The laborations are made in small groups (normally of 3-4 persons). At all laborations the participants first plan the experiment, then do the experiment and evaluate the results, and finally discuss a list of complex questions related to the experiment. At some laborations the different groups do different experiments and the results are orally presented to the other groups at the end of the laborations. At the other laborations the same experiments are made by all groups and the results are discussed at a discussion at the end of the laboration. All students are required to take an active part in the laborations.

Examination details

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

Assessment: Written examination and student experiments. The performance on the written examination forms the basis for the final mark of the course.

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.

Parts

Code: 0113. **Name:** Written Examination.

Credits: 5. **Grading scale:** TH. **Assessment:** Written examination

Code: 0213. **Name:** Laboratory Work.

Credits: 2,5. **Grading scale:** UG. **Assessment:** Laboratory Work

Admission

Assumed prior knowledge: VBM012 Building Materials OR VBMA30 Building Materials AND VBFA01 Building Technology and Building Services.

The number of participants is limited to: No

The course overlaps following course/s: VBM070

Reading list

Contact and other information

Course coordinator: Professor Lars Wadsö, Lars.wadso@byggtek.lth.se

Course administrator: Linnéa Ekman, linnea.ekman@ebd.lth.se

Course homepage: <http://www.byggnadsmaterial.lth.se/utbildning/vbmf05>