



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Byggnadsfysik **Building Physics**

VBFF10, 6 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

Compulsory for: IBYA2

Language of instruction: The course will be given in Swedish

Aim

- have general knowledge about how to design single-family buildings
- have basic knowledge about different building components and how to combine them into a healthy
- and energy-efficient building
- have basic knowledge about heat- and moisture transport in a building
- be able to identify and solve different building physics problems

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- Understand how to combine building materials into a well functioning building component from a heat and moisture point of view.
- Identify all parts in an energy balance.
- Quantitatively be able to evaluate the moisture safety for a building.

Competences and skills

For a passing grade the student must

- Design building components for a single-family house and join them together to form a functioning building regarding energy application and moisture proofing..
- Apply knowledge from the course VBFA10 to design buildings that fulfil minimum

- demands in the Swedish Building code concerning energy needs.
- Skills in using theories concerning moisture transport through building components. Have the capability to choose appropriate values for boundary conditions and material data. Be able to quantitatively estimate building components and ordinary buildings from a moisture safety point of view.

Contents

Basic building physics concerning heat-and moisture transport through materials and building elements. Calculations of moisture- and temperature conditions in building elements to create moisture proof and energy-efficient buildings. Building physical design of the building envelope, roofs, foundations and external walls. Information about methodology for moisture design, critical moisture conditions and healthy buildings.

In order to learn which parts are of importance, stationary energy- and moisture balances are established.

The project exercise is a fundamental element in the course, where the coupling between building envelope, combination of materials, control point system and nonloadbearing partitions are dealt with. The final results from the exercise are elementary building documents and drawings.

Examination details

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

Assessment: Written examination with a theoretical and a calculation part. To pass the course the students also must fulfil and pass the project exercise. A well accomplished project exercise can raise the final grade.

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: 0117. **Name:** Assignment.

Credits: 2. **Grading scale:** UG. **Assessment:** The project must contain correctly described and drawn components of a single family house. **Contents:** The assignment must contain 5 parts. It must contain u-value calculations, foundation description, wall description, roof description and a section of the single family house putting all the components together correctly.

Code: 0217. **Name:** Examination.

Credits: 4. **Grading scale:** TH. **Assessment:** A written exam with two parts, theory and calculation parts. **Contents:** A written exam with two parts, theory and calculation parts.

Admission

Admission requirements:

- VBF630 Building Technology or VBFA10 Building Technology

The number of participants is limited to: No

The course overlaps following course/s: VBF605

Reading list

- Sandin, K: Praktisk byggnadsfysik. Studentlitteratur, 2010, ISBN: 9789144059914.
- Sandin, K: Praktisk byggnadsfysik, Övningsbok. Studentlitteratur , 2010, ISBN: 9789144059891.
- Harderup L-E: Övningsuppgifter med lösningar till Fukthandbok.
- Harderup L-E: Formelsamling till Fukthandbok. 2017.
- Arfvidsson, Harderup, Samuelson: Fukthandbok, Praktik och Teori. Svensk Byggtjänst, 2017, ISBN: 978-91-7333-823-3.
- Utdelade föreläsningar tillgängliga på hemsidan.
- Bengt Strandberg, Fredrik Lavén: Bygga Hus , Illustrerad bygglära. Studentlitteratur, 2021, ISBN: 978-91-44-15112-0. Not required but can be used for reference.

Contact and other information

Course coordinator: Petter Wallentén, petter.wallenten@byggtek.lth.se

Course homepage: <http://www.byfy.lth.se>

Further information: The project exercise runs all through the courses VBEF10 and ABKF05.