

Course syllabus

Energi, luft och fukt vid ombyggnad och förvaltning

Energy, Air Movements and Moisture at Rebuilding and Administration

VBFN05, 7,5 credits, A (Second Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED V

Date of Decision: 2023-03-21

General Information

Elective for: V4-hb, V4-bf

Language of instruction: The course will be given in Swedish

Aim

To give the student advanced knowledge concerning energy, moisture, quality and environmental issues and reliability in existing buildings and building elements during management, and design stage and production during rebuilding to get buildings that in the long run are moisture sustainable, have low operational costs, healthy indoor environment and meet future climate goals.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- Measure different indoor climate parameters, identify problems from measurements and suggest measures including possible balancing.
- Perform energy analysis and suggest energy efficiency measures.
- Review and identify substances in the building and in the building services that are harmful to the environment.

- Interpret documents and drawings concerning building design and building services and to identify possible deficiencies.
- Describe design of building- and service techniques in older buildings.

Competences and skills

For a passing grade the student must

- Apply different measuring methods and estimate and evaluate their reliability.
- Work out part of maintenance plans as a result of measurements, inspections and examination of available documents and suggest measures on how to improve the indoor environment.
- Ability to generalize and use acquired knowledge in other projects.
- Calculate and estimate the influence from three-dimensional thermal bridges.
- Show ability for teamwork and collaboration in groups. Demonstrate the ability to orally and in writing in dialogue with other groups present and discuss their results and conclusions.
- Be able to calculate air flow and pressure distribution within a building and through building components and its interaction with the ventilation system and be able to understand consequences of air leakage.

Judgement and approach

For a passing grade the student must

- Estimate if different measurement methods are suitable and reliable.
- Have ability to identify the need for further knowledge to develop his/her competence.

Contents

- Prepare documents for measures and control plans for moisture protection and environmental management at all stages of the construction process.
- Inform about new national and international regulations for the building trade. Analyse and illustrate what consequences the new regulations will lead to.
- Inform about different methods to analyse new and existing settlements concerning building technique, indoor climate, moisture safety and building services systems to give priority to different housing improvement and energy saving measures.
- Follow-up of operational statistics of a building's energy use to obtain a rational use of energy.
- Analyse moisture safety, energy consumption and indoor environment in buildings.
- Study building technique in older buildings.
- Inform about building services in older buildings.
- Learn to interpret old and new drawings from architects, designers and heating, water and sanitation engineering.
- General environmental knowledge regarding environmentally hazardous building and interior materials and methods for inventory and handling.
- Information about mould and rot in buildings.
- Quality assurance systems in the building trade.
- Design and conversion of wet rooms.
- Energy systems, balancing and construction automation.

Examination details

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

Assessment: 80% attendance at the total number of lectures. Passed written examination. The written examination will also contain questions from the lectures. To pass the course the students also must fulfil and pass the project exercises, do laboratory work and computer exercise. The quality of the project exercises may influence 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: 0114. **Name:** Energy, Air Movements and Moisture at Rebuilding .

Credits: 4. **Grading scale:** TH. **Assessment:** Written examination

Code: 0214. **Name:** Exercise.

Credits: 3,5. **Grading scale:** TH. **Assessment:** Written exercise

Admission

Admission requirements:

- VBFA01 Building Technology and Building Services
- VBMA30 Building Materials

Assumed prior knowledge: VBFF01 Energy Efficiency and Indoor Environment.

The number of participants is limited to: No

The course overlaps following course/s: VBF045

Reading list

- Reppen L, Kallstenius P, Björk C.: Så byggdes husen 1880-2000. , Arkitektur, konstruktion och material i våra flerbostadshus under 120 år. Liber 2003, ISBN: 91-540-5888-0.
- Pettersson, B, Dalenbäck, J-O: Åtgärder för ökad energieffektivisering i bebyggelsen. Chalmers Energicentrum 2005.
- Sundell, J, et al: Problem med inomhusklimatet. BFR A8:1997. Pdf-document on the website, (Extracts from).
- Presentationer och annat material från föreläsningar.
- Abel E, Elmroth A: Byggnaden som system. Studentlitteratur, 2016, ISBN: 978-91-44-11588-7.
- Sandin, K: Luftströmning. Kompendium. Lund 1990.
- Harderup och Nordquist: Räkneövningar i luftströmning.
- Dahlblom m.fl.: Installationsteknik för fastighetsmäklare-driftstatistik och graddagskorrigering. 2004. Pdf-document on the website (Extracts from).
- Föreläsarnas föreläsningsbilder.

Contact and other information

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