



AF2402 Acoustics and Fire 7.5 credits

Akustik och brand

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for AF2402 valid from Autumn 2021

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

The Built Environment

Specific prerequisites

Documented knowledge in Building Materials and Building Physics, 15 ECTS corresponding to the content in courses AF1301 and AF1402. Eng B/6 according to the Swedish upper secondary school system.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After the course the student should be able to:

- describe the effect of noise on man
- define fundamental acoustical issues
- describe how to measure and analyze sound
- explain fundamental principles of sound transmission, sound absorption and sound proofing
- calculate sound insulation in block of flats
- describe the propagation of a fire from ignition to a fully developed fire
- calculate some effects of burning liquids and solids
- define fire load density and opening factor
- describe the most important material properties in fire for commonly used building materials
- calculate temperatures in fully-developed compartment fires
- calculate the fire resistance for building components
- design simple buildings for safe evacuation in case of fire

Course contents

Building acoustics: Effect of noise on man. Basic acoustical definitions. Measurement and analysis of sound. Sound transmission, sound absorption and sound proofing. Impact sound, flanking transmission. Sound insulation in block of flats.

Fire safety engineering: Diffusion flames and fire plumes. Steady burning of liquids and solids. The growth period and definition of flashover. Fully developed fire behaviour. Human behaviour. Escape routes. Simulation of escape movements. Building codes. Material properties at elevated temperature. Structural design for fire safety.

Examination

- ÖVN1 - Exercises, 1.5 credits, grading scale: P, F
- TEN2 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Written examination (TEN1; 3p)
in building acoustics

Written examination (TEN2; 3p)
in fire safety engineering.

Exercises (ÖVN1; 1,5p)

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.