



Building Acoustics and Community Noise

Content and Learning objectives

Content

The course aims at the students to have knowledge of building acoustics, its causes and consequences, as well as the ability to implement basic planning regarding noise issues in construction projects. During the course, students will learn the basic knowledge of building acoustics, explain the guidelines for different sources of noise and explain why they exist.

Areas involved within the course include:

1. Perception of sound, different measurements and measurement methods
2. Room acoustics, sound propagation, reflexes, reverberation time, etc.
3. Building acoustic fundamental knowledge, sound insulation and how this is affected by walls, floor joists, resonances, windows, etc.
4. Traffic noise, how sounds from different of traffic sources are calculated and modified with e.g. noise screens
5. Community noise fundamental knowledge, WHO's Research Compilations, Guidelines, Health Impact, etc.
6. Ground vibrations and vibrations in buildings.

Learning objectives

Students will, after passing the course,

1. Be aware of the main features of the hearing system and how sound is experienced.
2. Know and be able to use space acoustic terminology.
3. Be able to formulate and execute calculations of basic building acoustic problems eg sound insulation and how this is affected by walls, floor joints, resonances, windows, etc.
4. Implement methods for calculating traffic noise.
5. Know the causes of current guidelines for noise, such as annoyance and medical reasons.
6. Be able to explain how ground vibration and vibrations in buildings arise, reproduce and are calculated.

Pedagogical structure

The pedagogical philosophy of the course consist of students are handled reading instructions and preparatory questions on the literature before the teaching occasions which are then discussed in a seminar form during the scheduled teaching. Students will receive formative feedback on these seminars and are also encouraged to provide feedback to each other during the discussions.

Links to degree objective

The course facilitates the following degree objectives (in Swedish):

- Visa kunskap om det valda teknikområdets vetenskapliga grund och beprövade erfarenhet samt insikt i aktuellt forsknings- och utvecklingsarbete
- Visa såväl brett kunnande inom det valda teknikområdet, inbegripet kunskaper i matematik och naturvetenskap, som väsentligt fördjupade kunskaper inom vissa delar av området
- Inom sitt teknikområde kunna praktisera ett kreativt och kritiskt arbetssätt för att inom givna ramar formulera och utforska problem med moderna metoder och verktyg
- Visa förmåga att planera och med adekvata metoder genomföra kvalificerade uppgifter inom givna ramar
- Visa förmåga att kritiskt och systematiskt integrera kunskap samt visa förmåga att modellera, simulera, förutsäga och utvärdera skeenden även med begränsad information
- Visa förmåga att utveckla och utforma produkter, processer och system med hänsyn till människors förutsättningar och behov och samhällets mål för ekonomiskt, socialt och ekologiskt hållbar utveckling

Language of instruction

The course literature is mainly in English and English will be spoken during the seminars unless all students are Swedish speaking and prefer to discuss in Swedish.

Detailed schedule

Posted on the Canvas page.

Key concept

Applying earlier knowledge to Building acoustics and Community noise.

Course literature and preparations

Special authorization

A basic course in Acoustics is required or should be read simultaneously, for instance SD2111 Engineering acoustics or similar.

Recommended previous knowledge

The course SD2140 Vibro acoustics or similar course content is recommended.

Course literature

Literature contains ISO-standards, WHO reports and EU documents as well as national reports from authorities. All literature is electronically available on Canvas/Files/Course literature.

Reading instructions

See schedule on Canvas.

Disability (fixed text)

Om du har en funktionsnedsättning kan du få stöd via Funka:

<https://www.kth.se/student/studentliv/funktionsnedsattning>

Informera dessutom kursledaren om du har särskilda behov. Visa då upp intyg från Funka.

Examination and completion

Rating scale

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

Examination

The examiner will use oral examination of the students. The students will be assessed individually and handled a set of questions (one for each learning objective) with a surveyed preparation time of one hour then when students are ready a discussion with the examiner will ensue until the student and examiner are satisfied. A preliminary grade will be given to

the student at the end of the discussion. If students do not fulfil any learning objective re-examination of that specific objective will be performed but passed learning objectives will not have to be re-examined. The discussion will be recorded by the examiner in order to be able to re-evaluate grade and for the student to be able to appeal an unfair grade.

Examiner

Karl Bolin