Chalmers University of Technology
Applied Acoustics
2018-03-14
Building acoustics and community noise, VTA 125, 7.5 ECTS
Chalmers International Master Programme in Sound & Vibration (MPSOV)
Quarter 4: 2018

Building acoustics and community noise

Dear student,

The main goal of the course is to ***understand the existing engineering prediction methods for building acoustics and community noise and to be able to critically judge the usage and the results.***

The ***learning outcomes****, as found at the student portal, are as follows.*
After completion of this course, the student should be able to

- *Understand and explain the physics behind sound propagation outdoors*
- *Understand and explain the physics behind sound propagation in buildings*
- *Apply the models and tools to predict the acoustic performance of buildings and evaluate their results critically*
- *Apply advanced models and tools for the prediction of sound propagation outdoors*
- *Understand and utilise standards in the field of building acoustics and sound propagation outdoors*
- *Define and analyse demands for a good acoustic environment indoors and outdoors.*

Hope you will enjoy the course!

Teachers:
Jens Forssén, tel. 772 8604, E-mail: jens.forssen@chalmers.se.
Georgios Diapoulis, tel. 772 6746, E-mail: georgios.diapoulis@chalmers.se.

Course assistant:
Georgios Diapoulis, tel. 772 6746, E-mail: georgios.diapoulis@chalmers.se.

Lectures and in-class exercises:
According to the schedule. The schedule may be changed to accommodate the wishes of the students.

Lecture room:
Applied Acoustics teaching lab.

Course literature:
Printed material (distributed via web) and book *Building Acoustics* by T. E. Vigran (available on loan via administrator Camilla Gäverström).

Project:
The project assignments are made in pairs.

Examination:
Written exam and project. Written exam at end of course (formula sheet and calculator are allowed): grades 3, 4 and 5 correspond respectively to 40, 60 and 80 % of the exam's maximum points. To pass the course, the written exam as well as the project assignment need to be passed. The total grade for the course is given by the average of the points of the two parts, i.e. written exam and project assignment.

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Content (for date and time see common schedule)

Study week 1
BAC (BA1) Lecture Building Acoustics. *General information about the course. Introduction to building acoustics. Single-leaf elements. Double-leaf elements.*
BAC (BA2) Lecture *Flanking sound transmission. (Home reading about sound absorbers.) Statistical energy analysis.*

Study week 2
bac exercise 1
bac exercise 2

Study week 3
BAC (BA3) Lecture Building Acoustics. *Statistical energy analysis (continued). Calculation according to standard for building acoustics including flanking sound transmission.*
BAC (BA4) Lecture Building Acoustics. *Demo of sound insulation software (Bastian)*
bac exercise 3

Study week 4
no lecture/exercise

Study week 5
BAC (CN1) Lecture Community Noise. *Introduction to outdoor sound propagation and community noise. Engineering models for road traffic noise sources (according to the Harmonoise and CNOSSOS-EU models).*
BAC (CN2) Lecture Community Noise. *Equivalent and maximum levels. Example of façade insulation. Refraction and ground effect.*
bac exercise 4
bac exercise 5

Study week 6
bac exercises: 6
bac exercises: 7

Study week 7
bac exercises: 8

Study week 8
BAC (CN3) Lecture Community Noise. *Diffraction. Diffraction and ground.*
BAC (CN4) Lecture Community Noise. *Other effects: atmospheric absorption and turbulence.*

Study week 9
Reserve time

Exam week
Written examination (date decided after course start)