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## Project tasks in Acoustics (VTAN01)

The following topics are available to pick from to perform the project tasks. One task per group is to be chosen and each group should not be composed of more than 3 people. If any group is interested in digging into a topic not included in the list below, please do not hesitate to contact the teachers to further discuss this possibility.

### 1. Impact sound insulation

In an existing two-storey house, whose floors are made of wood, it appears that the impact sound insulation in the low frequency range is insufficient. The task is to analyse the cause to this by means of a FE model, to propose what a satisfying sound insulation would be as well as to suggest improvements to the existing construction by means of parametric analyses in the numerical model developed.

### 2. Flanking transmission

This task deals with the application of the Swedish Standards (SS-EN 12354, SS 25267, SS 25268) to analyse the thickness of a concrete floor that is needed in order to achieve a sufficient sound insulation for a given situation. Moreover, the vibration reduction index and radiation factor shall be calculated for the case in question.

### 3. Double-leaf wall

Most calculation methods (i.e. analytical) focus on monolithic elements, i.e. single-leaf walls. Here, comparisons of the latter ones with walls involving more than one layer or leaf will be carried out. The assignment is to develop some numerical tools for understanding the sound transmission for different configurations and as well as to compare them with some analytical models.

### 4. Room acoustic design of multi-purpose hall (alt. restaurant or other purpose like schools, hospitals...)

The purpose with this task is to design a multi-purpose hall for an audience of 200 persons. The hall is primarily intended for lecturing but shall also be used for musical purposes (chamber music, jazz concerts, and the like).

### 5. Musical acoustics

This project task regards investigating and analysing different features of an acoustic guitar (or similar) from an acoustical point of view. A theoretical review of the instrument in question as well as an analytical and numerical analysis together with measurements should be performed.

All projects are to be presented in a written report. In addition to this, the presentation shall consist of a movie of maximum 7 minutes that, in a popular scientific way, introduces your task and how you have approached and solved it. The presentation takes place on December 15<sup>th</sup> at 13:15 in V:Q1.