**Noise and Vibration Control**

Code: MK3ZRVDK05KX17-EN

ECTS Credit Points: 5

Evaluation: mid-semester grade

Its prerequisite(s): MK3MFIZA06KX17-EN

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 2+3

**Topics**:

The theoretical part of the subject encompasses the following topics: The concept of noise. Basic Concepts. Levels. Operations with levels. Octave and one-third-octave frequency analysis. Propagation in free space. Point, line, and surface sound sources. Indoor propagation. Sound absorption, reverberation time, energy distribution in enclosed space. Acoustic insulation. Effects on humans. Sense acoustics. Phon, Son. Fletcher-Munson curves. Noise measurement and instruments. Environmental Noises. Environmental Noises (workplace, road traffic, railway, flight noise). Opportunities to reduce environmental noise. Strategic noise maps. Basic concepts of vibration. Man-made workplace vibrations. Vibration measurement (instruments, sensors). Modes of vibration reduction.

In the practical part, students perform road traffic, railway, industrial and workplace noise measurements and prepare reports. Additionally, they solve the calculations and tasks associated with this topic.

**Literature:**

*Compulsory:*

* Enda Murphy and Eoin King: Environmental Noise Pollution, 2014, ISBN: 978-0-12-411595-8
* Lawrence K. Wang, Norman C. Pereira, Yung-Tse Hung: Advanced Air and Noise Pollution Control, 2007, ISBN 1-59259-779-3

*Recommended:*

* M. P. Norton and D. G. Karczub: Fundamentals of Noise and Vibration Analysis for Engineers, 2003

**Schedule**

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| **1st week Registration week** | |
| **2nd week:**  **Lecture:** The concept of noise. Basic Concepts. Levels. Operations with levels  **Practice:** Calculations | **3rd week:**  **Lecture:** Octave and one-third-octave frequency analysis  **Practice:** Calculations |
| **4th week:**  **Lecture:** Propagation in free space  **Practice:** Road traffic noise measurement | **5th week:**  **Lecture:** Point, line, and surface sound sources  **Practice:** Road traffic noise measurement report |
| **6th week:**  **Lecture:** Indoor propagation. Sound absorption, reverberation time, energy distribution in enclosed space  **Practice:** Railway noise measurement | **7th week:**  **Lecture:** Acoustic insulation  **Practice:** Railway noise measurement report |
| **8th week: 1st drawing week** |  |
| **9th week:**  **Lecture:** Effects on humans. Sense acoustics. Phon, Son. Fletcher-Munson curves  **Practice:** Test | **10th week:**  **Lecture:** Noise measurement and instruments. Environmental Noises  **Practice:** Workplace noise measurement |
| **11th week:**  **Lecture:** Strategic noise maps  **Practice:** Workplace noise measurement report | **12th week:**  **Lecture:** Basic concepts of vibration  **Practice:** Industrial noise measurement |
| **13th week:**  **Lecture:** Workplace vibrations  **Practice:** Industrial noise measurement report | **14th week:**  **Lecture:** Vibration measurement (instruments, sensors). Modes of vibration reduction  **Practice:** Test |
| **15th week: 2nd drawing week** | |

**Requirements**

**A, for a signature:**

Attendance at **lectures** is recommended, but not compulsory.

Participation at **practice classes** is compulsory. A student must attend the practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. A student cannot make up any practice with another group. Attendance at practice classes will be recorded by the practice leader. Being late is equivalent with an absence. In case of further absences, a medical certificate needs to be presented. Missed practice classes should be made up for at a later date, to be discussed with the tutor. Students are required to bring the drawing tasks and drawing instruments of the course to each practice class. Active participation is evaluated by the teacher in every class. If a student’s behaviour or conduct does not meet the requirements of active participation, the teacher may evaluate his/her participation as an absence because of the lack of active participation in class.

Students have to submit all the **four noise measurement reports** as scheduled minimum on a sufficient level.

During the semester there are two **tests**: the mid-term test around the 8th week and the end-term test in the 15th week. Students have to sit for the tests and earn at least 51% of the maximum points.

**B, for grade:**

The grade is determined based on the total points of the two mid-semester tests. The minimum requirement is 51% of the total points. Based on the score of the tests, the grade for the course is given according to the following table:

Score Grade

0-50 fail (1)

51-62 pass (2)

63-75 satisfactory (3)

76-88 good (4)

89-100 excellent (5)

If the score of any test is below 51%, students can take a retake test in conformity with the EDUCATION AND EXAMINATION RULES AND REGULATIONS.