

Environmental Technologies III (Air and Noise Protection)

Code: MK5KVT3K03K117-EN

ECTS Credit Points: 3

Evaluation: mid-term grade

Year, Semester: 2nd year/1st semester

Number of teaching hours/week (lecture + practice): 0+3

Topics:

Within the subject, students learn about the air chemistry basic concepts, the most important air pollutants and their environmental and health effects, atmospheric physical and chemical transformation processes and "Indoor" pollutants, and calculating tasks related to the topics discussed. They also get acquainted with the possibilities of modelling air pollutant emissions and the modelling environmental impacts of urban transport.

The noise protection part covers the following topics: The concept of noise. Basic Concepts. Levels. Frequency distribution. Sound propagation in free space. Indoor propagation. Room acoustics. Sound absorption, reverberation. Sense acoustics. Strategic noise maps.

Literature:

Required:

- Noel de Nevers: Air Pollution Control Engineering, (Third Edition, 2017) ISBN 978-1-4786-2905-4
- Lev S. Ruzer and Naomi H. Harley: Aerosol Handbook: Measurement, Dosimetry, and Health Effects, (Second Edition, 2013) ISBN 978-1-4398-5510-2
- 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: Practice: Air chemistry basic concepts. The most important air pollutants and their environmental and health effects. Calculations. | 3rd week: Practice: Atmospheric physical and chemical transformation processes. Acid rain. Calculations. |
| 4th week: Practice: "Indoor" pollutants – calculations. | 5th week: Practice: Air pollution measurements, Emission estimates and calculations. |
| 6th week: Practice: Modelling urban transport and environmental impacts. | 7th week: Practice: Mid-term test. |
| 8th week: 1st drawing week | |
| 9th week: Practice: The concept of noise. Basic Concepts. Levels. Operations with levels. Frequency analysis (octave, 1/3 octave bands, FFT. Calculations. | 10th week: Practice: Free space propagation, modifying terms. Point, line, and surface sound sources. Vibration measurements and instruments. |
| 11th week: | 12th week: |

Practice: Indoor propagation. Sound absorption, reverberation time, energy distribution in enclosed space. Acoustic insulation, noise reduction.

13th week:

Practice: Noise mapping.

15th week: 2nd drawing week

Practice: Effects on humans. Sense acoustics. Phon, Son. Fletcher-Munson curves. Filters. Basic concepts of vibration. Human vibrations. Workplace vibration measurement (instruments, sensors). Modes of vibration reduction.

14th week:

Practice: Test.

Requirements

A, for a signature:

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

Attending practices is compulsory. Students have to 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. Students 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 previously 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 two **reports** as scheduled minimum at a sufficient level.

During the semester there are two **tests**: a mid-term test around the 8th week and an 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 a 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 (score/grade): 0-59 = fail (1); 60-69 = pass (2); 70-79 = satisfactory (3); 80-89 = good (4); 90-100 = excellent (5).

If the score of the test is below 50, students can retake that test in conformity with the EDUCATION AND EXAMINATION RULES AND REGULATIONS.