COURSE DESCRIPTION CARD - SYLLABUS

Course name

Noise Control in Industry

Course

Field of study

Mechanical Engineering

Year/Semester

III/1

Area of study (specialization)

technical sciences

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

English

Form of study

full-time

Requirements

elective

Number of hours

Lecture

7

Laboratory classes

8

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Dr. Wojciech ŁAPKA, PhD. DSc. Eng.

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Faculty of Mechanical Engineering

Jan Paweł II 24, 61-139 Poznań

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Responsible for the course/lecturer:

Prerequisites

Knowledge: basic knowledge of engineering and management, mathemetics (core curriculum for secondary schools, basic level)

Skills: ability to solve elementary problems of engineering based on possessed knowledge, usage of mathematical and engineering issues, the ability to acquire information from indicated sources

Social competences: understanding the need of further education; willingness to cooperate with a team

Course objective

1. Obtaining knowledge of noise control in industry in the scope determined by the content of the curriculum, appropriate for the field of study

2. Development of skills to identify and analysis of noise sources, perform analysis of industrial problem with noise based on gained knowledge

3. Developing teamwork skills.

Course-related learning outcomes

Knowledge

Student is able to define the basic engineering concepts in the range of course content, appropriate for the field of study, identify noise sources in industry, use engineering tools (sound level meters and analyzers) to measure sound pressure levels, sound analysis in 1/1 and 1/3 octave bands.

Student has expertise in practical use and modeling aided design equipment including simplifying assumptions used in the modeling, create a mathematical model of the physical mechanical system, formulation of model equations and methods of solving them.

Skills

Student is able to obtain information from the literature, databases and other carefully selected sources (also in j. English) in mechanics and mechanical engineering and other technical and engineering problems consistent with the field of study; can integrate the information obtained, to make their interpretation, as well as draw conclusions and formulate and justify opinions.

Student is able to select proper tools to assesst the noise hazards in industry, identify noise sources, sound analysis, calculate the noise level exposition at selected workplace

Social competences

Student is able to cooperate in a team, be responsible for his/her position in the team and actively participate in practical laboratory exercises, set priorities for implementation of the task.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Checking theoretical knowledge by verbally answering questions and evaluation of written reports of laboratory exercises

Programme content

Basic definitions: sound, noise, sound pressure level, sound wave, acoustic field, sound intensity, sound power, sound level correction characteristics A and C, sound absorption and reflection coefficients, reverberation time, etc. Description of tools used to measure sound, sound level meters and analyzers. Close and far acoustic field, noise reduction methods, noise hazards in industry, identification of noise sources, sound analysis, calculation of noise level exposition at selected workplace, sound analysis in 1/1 and 1/3 octave bands, determination of sound absorption coefficients of absorptive materials in Kund's pipe.

The laboratory contains the basic aspects of noise control in industry: assessment of noise level exposition at selected workplace, sound analysis in 1/1 and 1/3 octave bands, determination of sound absorption coefficients of absorptive material in Kund's pipe, determination of sound power level of sound source according to ISO 3746.

Teaching methods

Lectures: multimedia presentations, a presentation illustrated with examples given on the board.

Laboratory: performing exercises using the necessary equipment (sound meter and analyzer, stand for determining the sound absorption coefficient - Kundt's tube, etc.), recording the results obtained during the exercises, preparing a report and delivering to the teacher for evaluation.

Bibliography

Basic

1. Crocker J. Malcolm, Handbook of Acoustics, John Wiley & Sons, INC., 1998.

2. Ver I. L., Beranek L. l., Noise and Vibration Control Engineering, John Wiley & Sons, INC., 2006.

Additional

1. Munjal M. L., Acoustics of Ducts and Mufflers with Application to Exhaust and Ventilation System Design, John Wiley & Sons, INC.,1987.

2. Engel Z. , Kowal J. , Sterowanie procesami wibroakustycznymi, Wydawnictwa AGH 1995.

3. Cempel C., Wibroakustyka stosowana, PWN, Warszawa, 1989.

4. Puzyna Cz. Zwalczanie hałasu w przemyśle, WNT, Warszawa 1974.

5. Makarewicz R., Dźwięki i fale, Wyd. Naukowe UAM, Poznań, 2004.

6. Engel Z., Sikora J., Obudowy dźwiękochłonno-izolacyjne. Podstawy projektowania i stosowania, Wyd. AGH, Kraków, 1998.

7. Engel Z. , Ochrona środowiska przed drganiami i hałasem, PWN Warszawa 1993

8. Wibroakustyka Maszyn i Środowiska red. Engel Z. , Wiedza i Życie Warszawa 1995

9. Makarewicz R. , Hałas w środowisku, Ośrodek Wydawnictw Naukowych Poznań 1996

Breakdown of average student's workload

	Hours	ECTS
Total workload	62	2,0
Classes requiring direct contact with the teacher	20	1,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	42	1,0

[1] delete or add other activities as appropriate