



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Measurements of mechanical quantities [S1Trans1>PWM]

Course

Field of study

Transport

Year/Semester

2/3

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

0

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

2,00

Coordinators

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Lecturers

Prerequisites

Has basic knowledge of physics, mechanics and strength of materials

Course objective

Learning the methods of measuring mechanical quantities

Course-related learning outcomes

Knowledge:

The student has extended and in-depth knowledge of physics useful for formulating and solving selected technical tasks, in particular for correct modeling of real problems

The student has an ordered, theoretically founded general knowledge of technology, transport systems and various means of transport

Skills:

The student is able to properly plan and conduct perform experiments, including measurements and computer simulations, interpret the obtained results, and correctly draw conclusions

The student is able, when formulating and solving tasks in the field of transport, to apply appropriately

selected methods, including analytical, simulation or experimental methods

Social competences:

The student is aware of the importance of knowledge in solving engineering problems, knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Credit based on the test of knowledge of the lectures and the current control of preparation for laboratory exercises and assessment of their course and reports.

Programme content

Scientific knowledge. Methodology of empirical research. Tests of machines and devices at the stages of construction, manufacturing and operation. Metrological concepts: quantity, property, property, value. Measurement; definitions, systems of units. General principles of measurement methods for mechanical quantities. Measurement of stress, force, torque and rotational speed. Construction of a measuring system. Measurement system: sensor, transducer, meter, recorder. Computer software for carrying out: analysis, recording and archiving of measurements. Error analysis, preparation of results and formulation of conclusions from measurements

Course topics

In laboratory classes in the subject of measurement of mechanical quantities, the following topics are implemented:

1. complex state of stress. Static and dynamic measurements.
2. time-varying velocity measurements using the example of a universal joint coupling.
3. torque measurements
- 4 Determination of critical rotations of shafts
5. Programming of measurements in the Agilent VEE environment
6. Use of a potentiometric displacement transducer for path mapping

Teaching methods

Laboratory with taking measurements

Bibliography

Basic

Hagel R., Zakrzewski J.: Miernictwo dynamiczne, WNT Warszawa 1984

Nawrocki W.: Komputerowe systemy pomiarowe, WKŁ Warszawa 2002

Piotrowski J.: Podstawy miernictwa, WNT Warszawa 2002

Additional

Breakdown of average student's workload

	Hours	ECTS
Total workload	40	2,00
Classes requiring direct contact with the teacher	15	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00