COURSE DESCRIPTION CARD - SYLLABUS

Course name

Measurements of mechanical quantities

Course

Field of study

Aerospace Engineering

Year/Semester

3/6

Area of study (specialization)

Aircraft engines and airframes

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

polish

Form of study

full-time

Requirements

elective

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

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Institute of Working Machines and Motor Vehicles

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Has basic knowledge of physics, mechanics and strength of materials.

Course objective

Understanding the methods of measuring mechanical quantities.

Course-related learning outcomes

Knowledge

has basic knowledge of measurement methods, characteristics of measuring instruments and their classification according to purpose, principles of operation and features, knows sensors and measuring transducers, registration of results, measurement systems, measurement errors - the influence of

external factors, statistical analysis of measurement results, principles of organization of an active experiment and passive], has basic knowledge in the field of strength of materials, including the basics of the theory of elasticity and plasticity, strain hypotheses, methods of calculating beams, membranes, shafts, joints and other simple structural elements, as well as methods of testing material strength and the state of deformation and stress in constructions , has basic knowledge in the field of technical diagnostics as well as methods and methods of solving problems of assessment of their technical condition and forecasting, knows: conditions for diagnosing technical objects, the essence of technical diagnostics and aviation engineering, tasks and goals of technical diagnostics

Skills

knows how to use a language to the extent that it is possible to understand technical texts in the field of aviation (knowledge of technical terminology), is able to obtain information from literature, the Internet, databases and other sources. Is able to integrate obtained information, interpret and draw conclusions from them], is able to analyze objects and technical solutions, is able to search in the catalogs and manufacturers' websites ready components of machines and devices, including means of transport and storage, assess their suitability for use in own technical and organizational projects

Social competences

Is aware of the importance of maintaining the principles of professional ethics], understands the need for a critical assessment of knowledge and continuous learning , is able to inspire and organize the learning process of others

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Credit based on the test of mastering the knowledge of lectures and ongoing control of preparation for laboratory exercises and assessment of their course and report.

Programme content

Scientific knowledge. Methodology of empirical research. Tests of machines and devices at the stages of construction, manufacture and operation. Metrological concepts: size, property, property, value. Measurement; definitions, unit systems. General principles of measuring methods of mechanical quantities. Measurement of stress, force, torque and rotational speed. Construction of the measuring system. Measurement system: sensor, transducer, meter, recorder. Computer software for conducting: analysis of recording and archiving measurements. Analysis of errors, preparation of results and formulation of conclusions from measurements.

PART - 66 (PRACTICE - 11.25 hours)

MODULE 7A. MAINTENANCE ACTIVITIES

7.2 Workshop Activities

Using tools, caring for tools, using workshop materials;

Sizes, clearances and tolerances, workmanship quality standards;

Calibration of tools and equipment, calibration standards. [3]

Teaching methods

Lecture: multimedia presentation, illustrated with examples given on a board,

Laboratory exercises: performance of tasks given by the teacher - practical exercises.

Bibliography

Basic

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

2. Nawrocki W.: Komputerowe systemy pomiarowe, WKŁ Warszawa 2002

Additional

3. Piotrowski J.: Podstawy miernictwa, WNT Warszawa 2002

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2
Classes requiring direct contact with the teacher	35	1,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	15	0,5

[1] delete or add other activities as appropriate