COURSE DESCRIPTION CARD - SYLLABUS

Course name
Design of pneumatic systems

Course

Field of study
Construction and Exploitation of Means of Transport

Year/Semester
1/2

Area of study (specialization)
Food Industry Machines and Refrigeration

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
Polish

Form of study
part-time

Requirements
compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
18	9	
Tutorials	**Projects/seminars**	
0	0	

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
dr inż. Andrzej Waliszewski

Responsible for the course/lecturer:

Prerequisites

Has knowledge of the methods of measuring mechanical quantities. He knows the structure of measuring systems and computer software to carry out: analysis, registration and archiving of results can carry out measurements: static and dynamic deformation of machine elements tensometric method, torque and variable speed with computer application digital recorder. Is able to develop the measurement results, determine their error, formulate conclusions and make a report.

Course objective

Acquisition of the ability to plan, organize and conduct research on machines from a system perspective with with particular emphasis on the specificity of machines and devices in the food industry and research issues consumables.

Course-related learning outcomes

Knowledge

1. Has a general knowledge of systems and their structure. Knows how to plan and organize research in system perspective.

2. Knows modern technical means of research - analog and digital measurement systems.

3. Has knowledge of functional tests of machines, devices and technological lines as well as research acceptance and approval.

4. Knows how to evaluate the energy consumption of production line components.

5. Has knowledge of microbiological testing systems in machine operation.

Skills

1. Can plan and conduct experimental research of specific processes taking place in machines and routine tests of a working machine or a vehicle from a selected group of machines.

2. Is able to carry out basic measurements of mechanical quantities on the tested working machine with using modern measuring systems.

Social competences

He is ready to fulfill social obligations, inspire and organize activities for the benefit social environment.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Final exam. Assessments for the preparation of the student on the basis of tests performed before starting each laboratory exercise.

Programme content

Lectures. Systems and their structures - general knowledge. Planning and organization of research in terms of system. Modern technical means of research - analog and digital systems measuring. Methodology of using information technologies in machine research. Research functionality of machines, devices and technological lines (characteristics, optimization possibilities). Acceptance and approval tests. Strength, durability and reliability tests (monitoring). Assessment of energy consumption of production line components. Microbiological testing systems in operation of machines.

Laboratory exercises. Reciprocating compressors acceptance tests. Testing of resistance when displacing margarine. Determination of frictional resistance of packaging against surfaces of conveyor elements. Assessment the effectiveness of vibration isolation in machines. Determination of the natural frequency of elements machines. The use of infrared spectrophotometry to test lubricants used in operation of machines.

Teaching methods

Lecture with a multimedia presentation and laboratory exercises.

Bibliography

Basic

1. Bojarski W., Podstawy analizy i inżynierii systemów, PWN , Warszawa 1984

2. Przystupa F.(red.), Systemy i technologie informatyczne w badaniach i praktyce, Ofic. Wydawn. Politechniki Wrocławskiej, Wrocław 1996

3. . Podstawy trwałości elementów maszyn przemysłu spożywczego, pr. zb., Wyd. Politechniki Poznańskiej, skrypt nr 1750, Poznań 1994

4. . Nawrocki W., Komputerowe systemy pomiarowe, Wyd. Komunikacji i Łączności, Warszawa 2002

5. Kolman R.- Kwalitologia, Warszawa 2009

6. Wawrzecki J. (red.) - Drgania mechaniczne : drgania układów liniowych Politechnika Łódzka. Łódź 2006

Additional

1. Boryczko A. - Podstawy pomiarów wielkości mechanicznych, Gdańsk 2010

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,0
Classes requiring direct contact with the teacher	50	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	25	1,0

[1] delete or add other activities as appropriate