COURSE DESCRIPTION CARD - SYLLABUS

Course name
Transport and warehousing of loose goods [S1MiBP1>TiMTS]

Course

Field of study
Mechanical and Automotive Engineering

Year/Semester
3/6

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
elective

Number of hours

Lecture
30

Laboratory classes
15

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

3,00

Coordinators

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Lecturers

Prerequisites

Student has a basic knowledge of transport and storage. Is able to integrate the obtained information, interpret it, draw conclusions, formulate and justify opinions. Is aware of the importance and understands the non-technical aspects and effects of transport and storage activities.

Course objective

The aim of the course is to learn about the most important issues related to working with loose materials. In particular, issues related to: transport (trucks, containers), storage (silos), physico- mechanical properties of loose materials.

Course-related learning outcomes

Knowledge:
1. Has knowledge in the field of physics, including the basics of classical mechanics, optics, electricity and magnetism, solid state physics, quantum and nuclear physics, necessary to understand specialist lectures in the field of the theory of construction materials and materials science, theory of machines and mechanisms, theory of electric drives and mechatronic systems .
2.Has basic knowledge in the field of chemistry, in the construction of the periodic table of elements and

their properties, the theory of chemical bonds, organic and inorganic compounds, types of chemical reactions, chemical analysis: in the scope enabling the understanding of lectures on metal and non-metallic materials, environment, fuels and lubricants, building materials and soil, biomechanics and biological materials processed by agricultural and food machinery.
3. Has ordered basic knowledge of the main divisions of technical mechanics: statics, kinematics and dynamics of a material point and a rigid body.
4. Has basic, ordered knowledge of metal materials used in mechanical engineering, such as alloys of iron, aluminum, copper, etc. used in machine building, and in particular about their structure, properties, methods of production, heat and thermo-chemical treatment and the impact of plastic working on them strength.
5. Has basic, structured knowledge of non-metallic and composite materials used in the construction and operation of machines, mainly ceramic materials, synthetic materials, non-metallic natural materials (wood, glass, stone) and fuels, lubricants, technical gases, refrigerants, etc.
6. Has elementary knowledge of the impact of technology changes on the organization of social life as well as the health and psyche of individuals in human-machine contact.

Skills:
1. Can obtain information from literature, the Internet, databases and other sources. Can integrate the obtained information, interpret and draw conclusions from it, and create and justify opinions.
2. Can apply basic technical standards regarding unification and safety and recycling.
3. Can competently advise on the selection of a machine for a given application in the industry covered by the selected diploma path based on the acquired knowledge about a given group of machines.

Social competences:
1. Is ready to critically assess his knowledge and received content
2. Is ready to recognize the importance of knowledge in solving cognitive and practical problems and to consult experts in case of difficulties in solving the problem on its own.
3. Is ready to initiate actions for the public interest.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
lectures: Written (in-class) exam, laboratory classes: reports and written test

Programme content

Basic concepts and classifications related to loose materials. Stages of work with loose materials. Loading devices; transport (trucks, containers); storage (warehouses, silos). Physical and mechanical properties of loose materials: bulk density, apparent density, discharge angle, compressibility, cohesiveness, homogeneity, dispersibility and others. Sieve analysis. Control and measurement apparatus. Modeling of the course of processes with the participation of fragmented materials.

Course topics

Basic concepts and classifications related to loose materials. Stages of work with loose materials. Loading devices; transport (trucks, containers); storage (warehouses, silos). Physical and mechanical properties of loose materials: bulk density, apparent density, discharge angle, compressibility, cohesiveness, homogeneity, dispersibility and others. Sieve analysis. Control and measurement apparatus.

Teaching methods

Lectures: multimedia presentations; Laboratory: work with equipment and materials according to the laboratory plan

Bibliography

Basic
1. Prochowski L., Żuchowski A., Technika transportu ładunków, Wydawnictwo Komunikacji i Łączności WKŁ, Warszawa, 2009
2. Jałowiec T., Ładunkoznawstwo dla logistyki, Difin, Warszawa, 2021

3. Krasowska K., Popek M.: Ładunkoznawstwo. Wydawnictwo Uczelniane AM Gdynia, Gdynia, 2006
Additional
1. Reimbert M. Silosy teoria i praktyka. Arkady, 1956

Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	45	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	30	1,00