COURSE DESCRIPTION CARD - SYLLABUS

Course name
Cargo science [S1MiBP1>ŁAD]

Course

Field of study
Mechanical and Automotive Engineering

Year/Semester
3/5

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
15

Laboratory classes
30

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

4,00

Coordinators

dr inż. Natalia Idaszewska
natalia.idaszewska@put.poznan.pl

Lecturers

Prerequisites

Knowledge: Student has knowledge of understanding basic physical issues, the basics of chemistry; has a general knowledge of the impact of technical facilities and technologies on the environment Sills: Student is able to: think analytically, interpret the described phenomena Social competences: Student is able to work in a group, assuming different roles. The student is able to set priorities important for solving specific tasks. The student shows independence in solving problems, gaining and improving knowledge and skills.

Course objective

The aim of the study is to familiarize students with the systemic approach to cargo, taking into account the interaction in the overall functioning of transport, to learn about the classification of types of goods, quality characteristics of goods, criteria for the division and classification of loads, to learn the resistance of cargo for the time of transport and storage

Course-related learning outcomes

Knowledge:
M1_W02. 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 .
M1_W09. 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.
M1_W10. 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.
M1_W11. Has basic knowledge of the strength of materials, including the basics of the theory of elasticity and plasticity, stress hypotheses, calculation methods for beams, membranes, shafts, joints and other simple structural elements, as well as methods of testing the strength of materials and the state of deformation and stress in mechanical structures.
M1_W12. Has elementary knowledge of the basics of computer science, i.e. computer architecture, binary, decimal and hexadecimal counting system, representation of numbers and graphic characters in computer memory, variable types, general knowledge of low, medium and high level languages used in computer programming, operating systems , databases, RAD development environments, and typical engineering applications.
M1_W19. Has extended basic knowledge necessary to understand specialist subjects and specialist knowledge about the construction, construction methods, manufacturing and operation of a selected group of working, transport, thermal and flow machines covered by the diploma path.
M1_W21. Has elementary knowledge of the impact of machinery and technology on the natural environment and global energy balances.

Skills:
M1_U02. Can search in catalogs and on manufacturers" websites ready-made machine components to be used in his own projects.
M1_U03. Can use computer office packages for editing technical texts, including formulas and tables, technical and economic calculations using a spreadsheet and running a simple relational database.
M1_U07. Can apply basic technical standards regarding unification and safety and recycling.
M1_U15. Can perform basic functional and strength calculations of machine elements such as traction, gear, friction, bearings, rolling and sliding gears, clutches, brakes.
M1_U20. Can use the experience gained in an environment professionally involved in engineering activities related to the maintenance of devices, facilities and systems typical for the field of study.
M1_U27. Has the ability to self-educate with the use of modern teaching tools, such as remote lectures, websites and databases, teaching programs, e-books.

Social competences:
M1_K02. 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.
M1_K03. Is ready to fulfill social obligations and co-organize activities for the benefit of the social environment.
M1_K04. 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:
Laboratory- reports; Lectures - written exam;

Programme content

Basic definitions: transport, transport process, transport, goods, commodity science, cargo, cargo science, quality, standardization; cargo susceptibility; cargo classification; physical and physicochemical properties of loads; biochemical processes taking place in charges; influence of external factors on loads; packaging; loading units.

Course topics

LECTURE

1.Introductory information - basic concepts related to cargo science
2. Properties of loads
3. Securing loads
4. Packaging and marking of loads during transport
5. Hazards in the transport of special cargo
6. Quality and safety management systems in transport (HACCP, GP, ATP)
LABORATORIES
1. Marking of special loads
2. HACCP system in managing the safety and quality of transported cargo
3. The impact of vibrations on the quality of transported special loads

Teaching methods

Lecture: multimedia presentations; Laboratories: practical exercises.

Bibliography

Basic
1. .Karpiel Ł., Skrzypek M.: Towaroznawstwo ogólne, Wyd. Akademii Ekonomicznej 2000
2. Krasowska K., Popek M.: Ładunkoznawstwo, Wyd. Akademii Morkiej w Gdyni, 2015
3. Samotyja U. (red.), Małecka M. (red.), Towaroznawstwo w kształtowaniu jakości i cech prozdrowotnych żywności, Wydawnictwo Uniwersytetu Ekonomicznego w Poznaniu, Poznań 2011.
4 Cichoń Z. (red.), Towaroznawstwo żywności. Podstawowe metody analityczne, Wyd. UE w Krakowie. Kraków 2009
Additional
1. Mokrzyszczak H.: Ładunkoznawstwo. Technologia zabezpieczenia ładunków w transporcie. Wydawnictwo Komunikacji i Łączności, Warszawa 1974
2. . Mokrzyszczak H.: Logistyka. Podstawy procesów logistycznych. Wydawnictwo WIG, Białystok 1998
3. Semenom J. N. (red.) i inni: Zintegrowane łańcuchy transportowe. Centrum doradztwa i Informacji Difin, Warszawa 2008-

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,00
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)	55	2,00