



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Design of refrigerated bodies [S2MiBP1-PCh>PNPCh]

Course

Field of study

Mechanical and Automotive Engineering

Year/Semester

1/1

Area of study (specialization)

Refrigerated Vehicles

Profile of study

general academic

Level of study

second-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

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

KNOWLEDGE: has basic knowledge of cargo science and the basics of bodybuilding; know basics of technical drawing and use of AutoCAD. SKILLS: can perform basic construction calculations, drawing documentation from using AutoCAD; knows how to develop a computer program on the basis of a given task computational algorithm SOCIAL COMPETENCES: is aware of acting in a professional manner; understands the need continuous training

Course objective

Getting to know theoretical and practical problems related to the construction and execution refrigerated means of food transport. The use of computer tools for design refrigerated bodies.

Course-related learning outcomes

Knowledge:

Has a basic knowledge of the mechanics of solids and discrete systems with many degrees of freedom, mathematical modeling of physical and mechanical systems based on d'Alembert's principle and Lagrange's equations, mathematical description of materials using constitutive equations. He knows the modern engineering methods of computer graphics and the theoretical basis of

engineering calculations using the finite element method.
Has extensive knowledge of selected departments of technical mechanics related to the selected specialization.

Skills:

He can correctly select the optimal material and its processing technology for typical parts of working machines, taking into account the latest achievements in material engineering.

He can develop a technical description, offer and design documentation for a complex machine from a selected group of machines.

Can perform a medium complex design of a working machine or its assembly using modern CAD tools, including tools for spatial modeling of machines and calculations using the finite element method.

Social competences:

He is ready to critically assess his knowledge and received content.

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.

Is ready to fulfill professional roles responsibly, taking into account changing social needs, including:

- developing the professional achievements,
- maintaining the ethos of the profession,
- observing and developing the rules of professional ethics and acting towards the observance of these rules.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Ongoing monitoring of preparation (discussion) and activity in the classroom. Compulsory report on laboratory activities

Programme content

Food as cargo (load and transport susceptibility). Agreement on international transport of perishable food products and means of transporting them. Chassis isothermal (thermal insulation materials, production of structural elements, technology assembly). Additional equipment (movable floor, spreader bars). Loading platforms. Certification tests of isothermal bodies. Body condition diagnosis procedures isothermal. Preparation of the means of transport for loading. Characteristics of solutions structural refrigerated bodies for the transport of food. Estimation of the body dimensions, insulation thickness. Strength analysis of selected body elements: bottom binding frame, mounting of the aggregate, side and rear door frames. Use of AutoCAD for the process exterior design. Determination of axle loads for vehicles with bodies oversized - calculation algorithm. Estimate the cooling capacity demand for food transport bodies (DIN8959 standard, calculation algorithm). Characteristic chillers used in food transport - selection principles, methods assembly.

Course topics

Food as cargo. Agreement on international transport of perishable food products and means of transporting them. Chassis isothermal. Additional equipment. Certification tests of isothermal bodies. Body condition diagnosis procedures isothermal. Preparation of the means of transport for loading. Characteristics of solutions structural refrigerated bodies for the transport of food. Estimation of the body dimensions, insulation thickness. Strength analysis of selected body elements: bottom binding frame, mounting of the aggregate, side and rear door frames. Use of AutoCAD for the process exterior design. Determination of axle loads for vehicles with bodies oversized - calculation algorithm. Estimate the cooling capacity demand for food transport bodies. Characteristic chillers used in food transport - selection principles, methods assembly.

Teaching methods

1. Lecture with multimedia presentation
2. Laboratory exercises - solving design tasks

Bibliography

Basic

1. Zwierzycki W., Bieńczak K. [red.] Pojazdy chłodnicze w transporcie żywności, Systherm Serwis, Poznań 2006.
2. Kwaśniewski S. [red.] Pojazdy izotermiczne i chłodnicze, Navigator nr 7, Wrocław 1997.
3. Pikoń A., AutoCAD 2007 PL. Helion, Warszawa 2007.

Additional

1. Bieńczak K., Modelowanie warunków termicznych chłodniczego przewozu żywności. Wydawnictwo Politechniki Poznańskiej, Poznań, 2009.

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