



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Design of refrigerated bodies

			Course
Field of study			Year/Semester
Mechanics and vehicle construction			1/1
Area of study (specialization)			Profile of study
Refrigerated vehicles			general academic
Level of study			Course offered in
Second-cycle studies			polish
Form of study			Requirements
full-time			elective
			Number of hours
Lecture	Laboratory classes	Other (e.g. online)	
30	0	0	
Tutorials	Projects/seminars		
0	15		
Number of credit points			
3			

		Lecturers
Responsible for the course/lecturer:	dr hab. inż. Przemysław Tyczewski	Responsible for the course/lecturer: dr hab. inż. Arkadiusz Stachowiak, prof. PP
email:	przemyslaw.tyczewski@put.poznan.pl	email: przemyslaw.tyczewski@put.poznan.pl
Wydział Inżynierii Lądowej i Transportu		Wydział Inżynierii Lądowej i Transportu
ul.Piotrowo 3, 60-965 Poznań		ul.Piotrowo 3, 60-965 Poznań

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:

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.

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	3,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for tutorials, preparation for tests) ¹	30	1,0

¹ delete or add other activities as appropriate