



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Refrigeration vehicle restoration engineering

### Course

Field of study

Mechanical and Automotive Engineering

Area of study (specialization)

Refrigerated vehicles

Level of study

Second-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

polish

Requirements

elective

### Number of hours

Lecture

15

Laboratory classes

0

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

dr inż. Aleksandra Rewolińska

Responsible for the course/lecturer:

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Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

### Prerequisites

Knowledge: Basic information on the design, technology and operation of vehicles.

Skills: Logical thinking, using information obtained from the library and the Internet

Social competences: Understands the needs of learning and acquiring new knowledge

### Course objective

Acquainting with methods of restoring the fitness of refrigerated vehicles.

### Course-related learning outcomes

Knowledge



1. Has an extended knowledge of the processes occurring in the surface layer of machine structural elements and surface engineering methods.
2. Has extended knowledge of modern construction materials such as carbon plastics, composites, ceramics, in terms of their construction, processing technology and applications.
3. Has extended knowledge of material strength in the field of nonlinear models, fracture and fatigue strength, calculations of statically indeterminate structures, structure stability.

#### Skills

1. Can correctly select the optimal material and technology of its processing for typical parts of working machines, taking into account the latest material engineering achievements.
2. Can perform basic measurements of mechanical quantities on the tested working machine with the use of modern measuring systems.
3. Can design a technology of exploitation of a selected machine with a high degree of complexity.

#### Social competences

1. 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.
2. Is ready to initiate actions for the public interest.
3. Is willing to think and act in an entrepreneurial manner.

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written test of the lecture and completion of the project

#### Programme content

Methods of repairing associations and regeneration of vehicle parts, machining to repair dimensions, methods: cold and hot plastic deformation, welding, resistance and friction welding, galvanic and chemical methods. The use of plastics in the repair of refrigerated vehicles, bonding and sealing, including with the use of anaerobic-contact adhesives. Application conditions and selection criteria of the regeneration method. Controlling the durability of vehicle assemblies and parts in repair processes.

#### Teaching methods

1. Lecture with multimedia presentation
2. Exercise method (subject exercises, practice exercises) - in the form of auditorium exercises

#### Bibliography

##### Basic

1. Nosal S., Inżynieria odnowy maszyn : wybrane zagadnienia – Wydanie I. – Poznań, 2017



2. Jósko M., kowalczyk J., Mańczak R., nosal S., Ulbrich D., Inżynieria odnowy pojazdów samochodowych, Tom 1 Inżynieria obsługi Poznań, 2019
3. Jósko M., kowalczyk J., Mańczak R., nosal S., Ulbrich D., Inżynieria odnowy pojazdów samochodowych, Tom 2 Inżynieria naprawy Poznań, 2019
4. Cypko J., Cypko E. Podstawy technologii i organizacji napraw pojazdów mechanicznych. Wkił, Warszawa 1989
5. Kostrzewa S., Nowak B. Podstawy regeneracji części pojazdów mechanicznych. Wkił, Warszawa, 1986

Additional

1. Klimpel A., Napawanie i natryskiwanie cieplne. Technologie, WNT, Warszawa, 2000
2. Adamiec P., Dziubiński P., Regeneracja i wytwarzanie warstw wierzchnich elementów maszyn transportowych, Wyd. Pol. Śląskiej, Gliwice, 1999

**Breakdown of average student's workload**

	Hours	ECTS
Total workload	50	3,0
Classes requiring direct contact with the teacher	30	2,0
Student's own work (literature studies, preparation for tutorials, preparation for tests) <sup>1</sup>	20	1,0

<sup>1</sup> delete or add other activities as appropriate