



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Proecology of vehicle manufacturing and servicing technologies

### Course

Field of study

Year/Semester

Mechanical engineering

3/7

Area of study (specialization)

Profile of study

Transport ecology

general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

full-time

elective

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

30

0

Tutorials

Projects/seminars

0

0

### Number of credit points

4

### Lecturers

Responsible for the course/lecturer:

prof.dr hab. eng. Marek Idzior

Responsible for the course/lecturer:

### Prerequisites

KNOWLEDGE: Has basic knowledge of the construction of internal combustion vehicles and basic knowledge in the field of operation.

SKILLS: Has the ability to read diagrams, sketches and technical drawings related to the construction of vehicles.

SOCIAL COMPETENCES: Understands the relationship between the design, technologies of vehicle construction and operation.

### Course objective

Providing basic information on production processes, construction materials and servicing of motor vehicles in aspects of ecology.

### Course-related learning outcomes

Knowledge

The student has ordered and theoretically founded general knowledge in the field of key issues of



technology and detailed knowledge in the field of selected issues in this discipline of transport engineering

The student has knowledge of important development trends and the most important technical achievements and of other related scientific disciplines, in particular transport engineering

#### Skills

The student is able, when formulating and solving tasks in the field of transport, to apply appropriately selected methods, including analytical, simulation or experimental methods

The student is able to make a critical analysis of the functioning of transport systems and other technical solutions and to evaluate these solutions, including: is able to effectively participate in the technical inspection and assess the transport task from the point of view of non-functional requirements, has the ability to systematically conduct functional tests

The student is able to design elements of means of transport using data on environmental protection

#### Social competences

The student is aware of the social role of a technical university graduate, in particular, he/she understands the need to formulate and transfer to the society, in an appropriate style, information and opinions on engineering activities, technological achievements, as well as the achievements and traditions of the transport engineer profession

The student correctly identifies and solves dilemmas related to the profession of a transport engineer

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

Learning outcomes presented above are verified as follows:

Discussion with the use of illustrative materials related to the technologies of manufacturing and servicing motor vehicles in the aspect of their relationship with ecology. Written exam.

#### Programme content

Ecological conditions for the processes of manufacturing and servicing motor vehicles. Pro-ecological technologies and materials. Basic concepts in the field of technology, technological documentation, labor consumption, material consumption, process optimization, typing. Bodies, bearings, pistons and piston rings, connecting rods, cylinder liners, cylinder heads, valves, cams and camshafts, valve springs - design solutions, materials, fabrication and control. Pipes - methods of bending, cleaning. Assembly - methods, essential processes, organization of workstations. Vehicle repairs. Basic systems and methods of repair. Technical service and repair. General technological process of repair. Part regeneration methods. Planning of repairs. Determining the design and technological requirements for parts and repaired. Development of repair techniques for vehicles and their parts. Protection of the environment against pollution from factories, recycling.

#### Teaching methods



Lecture with multimedia presentation

## Bibliography

Basic

1. Stolarski B. (red.) – Technologia budowy samochodów, część I – Technologia silników spalinowych. Wydawnictwo Politechniki Krakowskiej, Kraków 1977.
2. Idzior M. - Technologia budowy silników spalinowych - Materiały dydaktyczne
2. Cypko J., Cypko E. – Podstawy technologii i organizacji napraw pojazdów mechanicznych. WKiŁ, Warszawa 1982.
3. Jezierski J. – Technologia tłokowych silników wysokoprężnych. WNT, Warszawa 1999.
- a środowiska w transporcie lądowym. Wyd. Instytutu Technologii i Eksploatacji, Poznań-Radom 2003.
4. Merkisz J., Ekologiczne problemy silników spalinowych, Tom I i II. Wyd. Politechniki Poznańskiej, Poznań 2000.

Additional

1. Press and specialist magazines
2. Information materials of companies producing internal combustion engines

## Breakdown of average student's workload

	Hours	ECTS
Total workload	90	4,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup>	45	2,0

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