



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Exploitation of technical means of transport

### Course

Field of study

Construction and Exploitation of Means of Transport

Area of study (specialization)

Level of study

First-cycle studies

Form of study

part-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

polski

Requirements

compulsory

### Number of hours

Lecture

9

Laboratory classes

Tutorials

9

Projects/seminars

Other (e.g. online)

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

dr hab. inż. Michał Libera

Responsible for the course/lecturer:

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### Prerequisites

**KNOWLEDGE:** The student has basic knowledge about the construction of means of transport and the principles of their operation components.

**SKILLS:** The student is able to analyze and synthesize information, draw conclusions, formulate and justify opinions

**SOCIAL COMPETENCES:** The student is aware of the importance of rational use of means of transport in technical, economic and ecological aspects.



### Course objective

The aim of the course is to acquire basic skills of formulating and solving problems of the use of means of transport.

### Course-related learning outcomes

#### Knowledge

has ordered, theoretically founded general knowledge of technology, transport systems and various means of transport

has basic knowledge of the life cycle of means of transport, both hardware and software, and in particular about the key processes taking place in them

#### Skills

can, when formulating and solving tasks in the field of transport, apply appropriately selected methods, including analytical, simulation or experimental methods

#### Social competences

understands that in technology, knowledge and skills very quickly become obsolete

is aware of the importance of knowledge in solving engineering problems and knows examples and understands the causes of malfunctioning transport systems that have led to serious financial and social losses or to serious loss of health and even life

can think and act in an entrepreneurial way, incl. finding commercial applications for the created system, bearing in mind not only the business benefits, but also the social benefits of the conducted activity

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written and oral test. Activity during classes and the implementation of a simple design task.

### Programme content

Putting into operation means of transport. Operation as a phase of product existence. Quality of operation. Classification of operational processes. The terminology of the exploitation theory.

Operational requirements for means of transport.

Problem groups in the theory of exploitation of means of transport.

Operational states. Airworthiness and unfitness condition, damage. Service life until failure and between failures. Limit state, durability. State assessment criteria. Typical courses of changes in technical condition. Statistical description of changes in technical condition. Analysis of operational data about mileage to failure and between failures. Analysis of the types, causes and effects of unfitness.

Operating factors influencing the condition of the vehicle. Road conditions. Driving conditions. Transport conditions. Climatic and natural conditions. Seasonal conditions. The role of man in vehicle operation



Praxeological model of the exploitation system. Symbols of operational state, operational graphs.

Use of means of transport. Organization of the use of the transport fleet.

Operating means of transport. Types of technical services. Inter-service life.

Criteria of operational efficiency. Determining the number of vehicles necessary to perform a specific transport work. Determining the number of vehicles to be repaired.

Case study. Analysis of real transport systems. Identification of the use model and maintenance strategy. Quantitative characteristics of the operational efficiency of fleets of transport companies (based on real data from transport companies).

### Teaching methods

Informative and problematic lecture with multimedia presentation and didactic discussion. Case study exercises.

### Bibliography

#### Basic

1. Gronowicz J.: Eksploatacja techniczna i utrzymanie samochodów. Wydawnictwo Uczelniane Politechniki Szczecińskiej, Szczecin 1997
2. Hebda M.: Eksploatacja samochodów. Wydawnictwo Instytutu Technologii Eksploatacji, Radom 2005
3. Smalko Z.: Podstawy eksploatacji technicznej pojazdów. Warszawa, Wydawnictwo Politechniki Warszawskiej, 1987
4. Orzełowski S.: Naprawa i obsługa pojazdów samochodowych. Wyd. Szkolne i Pedagogiczne, W-wa, 1998
5. Rydzikowski W., Wojewódzka-Król K.: Transport. PWN. W-wa, 2002
6. Uzdowski M., Abramek K., Garczyński K.: Pojazdy samochodowe. Eksploatacja techniczna i naprawa. WKŁ. W-wa, 2003
7. Niziński S.: Diagnostyka samochodów osobowych i ciężarowych, Dom wydawniczy Bellona, Warszawa 1999r

#### Additional

1. Macha E.: Reliability of machines. Wydawnictwo Politechniki Opolskiej, Opole 2001
2. Oprędkiewicz J., Stolarski B.: Komputerowe monitorowanie niezawodności samochodów. PWN, W-wa Kraków, 2000
3. Gołąbek A.: Eksploatacja i niezawodność maszyn. Wrocław, Wyd. Politechniki Wrocławskiej, 1988
4. Niziński S.: Eksploatacja obiektów technicznych. Wyd. ITeE, Radom, 2002



5. Moubray J.: Reliability centered maintenance, Industrial Press Inc, 2000
6. Kumar U.D., Crocer J., Knezewic J., El-Haram M.: Reliability, Maintenance and Logistic Support, Kluwert Academic Publishers, 2000
7. O'Connor P.D.T., Newton D., Bromley R.: Practical Reliability Engineering, John Willey and Sons, LTD, 2001

#### Breakdown of average student's workload

|   | Hours | ECTS |
|---|-------|------|
| Total workload  | 40    | 2,0  |
| Classes requiring direct contact with the teacher   | 18    | 1,0  |
| Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup> | 22    | 1,0  |

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