



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Polymers in the construction of motor vehicles [S1MiTPM1>PwKPM]

### Course

Field of study

Materials and technologies for automotive industry

Year/Semester

2/4

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

15

Other

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

dr inż. Kinga Mencil  
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### Lecturers

### Prerequisites

Basic knowledge of physics, chemistry, materials science. Logical thinking, using information obtained from the library and the Internet. Understanding the need to learn and acquire new knowledge.

### Course objective

Learning the advantages and disadvantages of polymers, the influence of structure on the basic properties of polymers, directions of application in the automotive industry. Adaptation of polymer materials to the guidelines according to regulations

### Course-related learning outcomes

Knowledge:

1. The student should characterize the basic types of polymer materials.
2. The student should explain the influence of polymer structure on their properties.

Skills:

1. The student is able to select polymer material for specific applications.
2. The student is able to determine the relationships between the structure and properties of polymers.

3. The student is able to propose a substitute research method.

Social competences:

1. The student is able to cooperate in a group.
2. The student is aware of the role of polymer materials in the modern economy and everyday life.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

Written assessment carried out at the end of the semester (pass if at least 50.1% of correct answers are obtained). Up to 50.0% - ndst, from 50.1% to 60.0% - dst, from 60.1% to 70.0% - dst+, from 70.1 to 80.0 - db, from 80.1% up to 90.0% - db+, from 90.1% - very good.

Lab:

Credit based on an oral or written answer regarding the content of each laboratory exercise performed, a report on each laboratory exercise according to the instructions of the laboratory instructor. To pass the laboratories, all exercises must be completed (positive grade for answers and reports).

### Programme content

During the classes, polymer materials with particular applications in the automotive industry will be presented. Their properties, advantages and disadvantages are discussed. Recycling methods.

### Course topics

Lecture:

1. Introduction, characteristics of properties,
2. The influence of structure on the properties of polymer materials
3. Physicochemical properties of plastics
4. Properties and applications of large-volume polymer materials from the thermoplastic group: polyolefins, poly(vinyl chloride), polystyrene and styrene copolymers, poly(methyl methacrylate), fluorine polymers, thermoplastic polyesters, aliphatic and aromatic polyamides, polycarbonates, polyurethane composites with carbon reinforcement, materials with wood flour. Polymer elements in cars. Electric cars and plastics. Recycling

Laboratories:

- 1-5. Research of polymer properties.
6. Production of polymers.

### Teaching methods

1. Lecture: multimedia presentation, presentation illustrated with examples given on the blackboard.

### Bibliography

Basic:

1. Sikora R.: Tworzywa wielkocząsteczkowe . Rodzaje, właściwości i struktura
2. Galina H.: Fizykochemia polimerów.
3. Broniewski T. metody badań materiałów polimerowych

Additional:

1. Bocheński C.I. 2001. Kompleksowy program zagospodarowania produktów odpadowych wytworzonych podczas eksploatacji środków transportu

### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	32	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	43	1,50