



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Selection and use of materials [S1MiTPM1>DiEM]

### Course

Field of study

Materials and technologies for automotive industry

Year/Semester

3/6

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

0

Other

0

Tutorials

15

Projects/seminars

30

### Number of credit points

3,00

### Coordinators

Marek Nowak

### Lecturers

### Prerequisites

Basic knowledge of materials science, physics and chemistry, material processing technology. Logical thinking, exploring of various sources of knowledge. Understanding of necessity of learning and acquisition of new knowledge.

### Course objective

The student should acquire knowledge on exploitation, destruction mechanics and methods of materials selection

### Course-related learning outcomes

Knowledge:

1. The student knows the relationship between the structure of the material properties to design and material selection for specific applications.
2. The student knows the properties and potential areas of application of engineering materials.
- 3 The student knows the impact of processing technology on properties of the materials.
4. The student knows the basic mechanisms of destruction / wear occurring in the operation of machines and devices.
5. The student knows the basic rules for the selection of materials.

#### Skills:

1. The student is able to determine the conditions of work and life and on their basis can make the choice of materials.
2. The student is able to use the sources of information, can interpret the information gathered.

#### Social competences:

1. Students can work in the group.
2. The student is aware of the role of selection and exploitation of materials in modern economy and society.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: credit on the basis of tests of general and detailed knowledge presented during classes in the subject

Tutorials: credit on the basis of a test and grades for completing tasks for individual completion

Projects: credit based on the effects of completed projects

### Programme content

Issues related to the selection of engineering materials

### Course topics

Technical, economic and ecological aspects of selection and exploitation of materials. Sources of obtaining information about materials. Working conditions of materials. Processes that determine durability and reliability of machine elements and devices: plastic strain, wear, fatigue, brittle failure, creep, corrosion. Material selection methods. Practical examples of materials selection.

### Teaching methods

Lecture: presentation illustrated with examples given on a blackboard

Tutorials: solving problems with the selection of material, discussion

Projects: individual project work of the student

### Bibliography

#### Basic:

1. Zasady doboru materiałów inżynierskich z kartami charakterystyk, Wydawnictwo Politechniki Śląskiej, Gliwice 2000.
2. Ashby M.F., Dobór materiałów w projektowaniu inżynierskim, WNT 1998

#### Additional:

1. Ashby M.F., Jones D.R.H., Materiały inżynierskie tom. 1 i 2, WNT, 2004.
2. Leda H., Wybrane metalowe materiały konstrukcyjne ogólnego przeznaczenia. Wyd. Politechniki Poznańskiej, Poznań, 1997.
3. Leda H., Strukturalne aspekty własności mechanicznych wybranych materiałów. Wyd. Politechniki Poznańskiej, Poznań, 1998

### Breakdown of average student's workload

|                                                                                                                                         | Hours | ECTS |
|-----------------------------------------------------------------------------------------------------------------------------------------|-------|------|
| Total workload                                                                                                                          | 75    | 3,00 |
| Classes requiring direct contact with the teacher                                                                                       | 60    | 2,50 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 15    | 0,50 |