

## SYLLABUS

Name: ***Material Technologies***

Name in Polish: ***Techniki materiałowe***

Name in English:

### Information on course:

Course offered by department:	Faculty of Organisation and Management
Course for department:	Silesian University of Technology
Study level and form:	Master degree, Full-time
Term:	summer semester 2023/24
Coordinator of course edition:	Dr hab. inż. Dorota Klimecka-Tatar prof. PCz

### Default type of course examination report:

Credit

### Language:

English

### Course homepage:

<https://platforma.polsl.pl/roz/>

### ECTS

2

### Short description:

The aim of the subject and its curriculum is to acquire structured knowledge, skills, and social competencies related to the characterization of engineering materials in the term of technology that is used to produce them. Additionally, it aims to gain fundamental knowledge about materials production and processing, as well as the impact of technology on the properties of materials and products."

### Description:

Detailed program contents

Lecture:

1. Materials classification and properties of materials: metals, polymers, ceramics, and composites.
2. Material production – traditional and novel technologies of materials production
3. Material processing – traditional and novel technologies of materials processing
4. Material technologies characterization and their performance.
5. Materials recycling - environmental and sustainability considerations.
6. Materials in Industry: automotive, electronics, healthcare, and construction.
7. Materials technology quality assessment

Classes:

1. General characteristics of all groups of engineering materials.
2. Characteristic and analysis of the chosen materials technologies - taking into account various material groups and manufacturing technologies.
3. Quality control in the material technologies.

Total number of contact hours with academic instructors or other instructors and students:

Lecture: 15 hours

Classes: 15 hours

Total number of hours for student self-study:

Preparation for assessment: 5 hours

Preparation for classes: 10 hours

Preparation of reports: 15 hours

Total number of hours: 60

ECTS: 2

The number of ECTS credit points obtained through classes conducted with the direct participation of academic instructors or other instructors and students is 1.

### Bibliography:

1. Ashby M., Shercliff, Ceb H. on D., Materials: Engineering, Science, Processing and Design, Amsterdam ; Oxford : Butterworth-Heinemann / Elsevier, 2014.
2. Callister William D., Jr., Rethwisch David G., Fundamentals of Materials Science and Engineering: an Integrated Approach : International Student Version, Singapore : John Wiley and Sons, 2016.
3. Askeland Donald R., Wright Wendelin J.; SI Edition prepared by D. K. Bhattacharya, Raj P. Chhabra, The Science and Engineering of Materials: SI Edition, Boston: Cengage Learning, 2016.
4. Supplementary resources:
5. Borkowski S., Sygut P. Improvement Processes in Materials Engineering and Commodity Science: Monography, Sci. Eds.: Zagreb, Croatian Quality Managers Society, 2015.

6. Cook R. D., Young Warren C., Advanced Mechanics of Materials. New York : Macmillan Publishing Company, 1985.
7. Abramovich H., Intelligent Materials and Structures, Berlin : Walter de Gruyter, 2016.

**Learning outcomes:****Knowledge: knows and understands**

K2A\_W01 - At an in-depth level - selected facts, objects and phenomena, as well as methods, theories and conditions explaining the complex relationships between them and constituting advanced general knowledge in the field of mechanical engineering in connection with other fields.  
K2A\_W09 - Typical engineering technologies in the field of study of management and production engineering and, to an extended and in-depth degree, selected issues in the field of material technologies.

**Skills: is able to**

K2A\_U05 - Design - in accordance with a given specification - and make a simple technical system; implement a technological process using appropriately selected methods, techniques, tools and materials.  
K2A\_U08 - Integrate and use advanced knowledge related to the field of study of management and production engineering when formulating and solving engineering tasks.

**Social competence: is ready for**

K2A\_K02 - Recognition of the importance of knowledge in solving cognitive and practical problems; consulting experts in the event of difficulties in solving the problem on his/her own.

**Assessment methods and assessment criteria:****Lecture:**

- Multimedia presentations.
- Case studies.
- Discussion and debate.

**Classes:**

- Completion of tasks according to instructions.
- Preparation of reports on the activities.

**Assessment Methods and Criteria:****Lecture:**

Attendance in lectures is not mandatory.

To pass the lecture, a positive evaluation can be obtained based on participation in the lecture or, in the case of not attending the lecture, by passing a concluding test.

A passing grade requires obtaining more than 50% of the possible points.

**Classes:**

Attendance in classes is mandatory.

In the event of a student's absence during classes and related academic deficiencies, these must be made up according to the specified conditions.

Classes tasks are carried out individually or in sections.

To pass the classes, it is necessary to submit correctly prepared reports from the activities and receive more than 50% of the possible points.

Reports from the activities are assessed in terms of both form and content.

Incorrectly prepared reports can be corrected twice.

The final assessment for the course takes into account 50% of the grade from the lecture and 50% of the grade from the laboratory. The final grade is the arithmetic average of the grades from the lecture and laboratory sessions.

**Practical placement:**

N/A