GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

| | | | |
|---|---|---|---|
| Subject name and code | , PG_00058708 | | |
| Field of study | Materials Engineering, Materials Engineering | | |
| Date of commencement of studies | February 2024 | Academic year of realisation of subject | 2024/2025 |
| Education level | second-cycle studies | Subject group | Optional subject group<br>Subject group related to scientific research in the field of study |
| Mode of study | Full-time studies | Mode of delivery | at the university |
| Year of study | 1 | Language of instruction | Polish |
| Semester of study | 2 | ECTS credits | 4.0 |
| Learning profile | general academic profile | Assessment form | exam |
| Conducting unit | Instytut Nanotechnologii i Inżynierii Materiałowej -> Faculty of Applied Physics and Mathematics | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | prof. dr hab. inż. Tomasz Klimczuk | |
| | Teachers | prof. dr hab. inż. Tomasz Klimczuk | |

**Lesson types and methods of instruction**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 30.0 | 0.0 | 0.0 | 0.0 | 15.0 | 45 |

E-learning hours included: 0.0

**Learning activity and number of study hours**

| Learning activity | Participation in didactic classes included in study plan | Participation in consultation hours | Self-study | SUM |
|---|---|---|---|---|
| Number of study hours | 45 | 5.0 | 50.0 | 100 |

**Subject objectives**

The purpose of the course is to familiarize students with the basic issues of superconductivity, followed by a thorough discussion of the most important superconducting compounds.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| K7_W01 | The student acquires extended knowledge in the field of materials engineering, in particular in the field of issues related to superconductivity and superconducting materials, both from a historical perspective and the latest achievements and trends in this field. | [SW1] Assessment of factual knowledge |
| K7_U01 | As part of the seminar classes, the student prepares and presents a seminar on issues related to the subject of the classes. When preparing a seminar, the student independently obtains the necessary information from literature, databases and all available sources, mainly in English, and acquires the ability to integrate it, critically analyze it, formulate appropriate conclusions and present the issues in an understandable way. | [SU2] Assessment of ability to analyse information |

**Subject contents**

- Superconducting metals;
- Superconducting alloys;
- Antiperovskites;
- Borocarbides;
- MgB2;
- Non-centrosymmetric superconductors;
- CuO2-based high-temperature superconductors;
- "Wet" superconductor;
- Iron-based superconductors;
- Exotic superconductivity.

<table>
<tr><td>Prerequisites and co-requisites</td><td colspan="3">Knowledge of synthesis techniques for inorganic materials. Knowledge of the basics of crystallography.</td></tr>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table><tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr><tr><td>seminar</td><td>60.0%</td><td>20.0%</td></tr><tr><td>exam</td><td>60.0%</td><td>80.0%</td></tr></table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td colspan="2">A.C. Rose-Innes, E.H.Rhoderick: Superconductivity</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Physical Review B, Physical Review M, Superconductor Science and Technology</td></tr>
<tr><td>eResources addresses</td><td colspan="2">Adresy na platformie eNauczanie:</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">What is the highest critical temperature among A15 class superconductors?</td></tr>
<tr><td>Work placement</td><td colspan="3">Not applicable</td></tr>
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