



## Subject card

|   |  |  |   |                                     |   |            |     |
|---|--|--|---|-------------------------------------|---|------------|-----|
| Subject name and code                       | Nanotechnology methods in science and technology, PG_00038594  |  |   |                                     |   |            |     |
| Field of study                              | Nanotechnology   |  |   |                                     |   |            |     |
| Date of commencement of studies             | October 2020   |  | Academic year of realisation of subject   |                                     | 2023/2024   |            |     |
| Education level                             | first-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                               | 4  |  | Language of instruction   |                                     | Polish  |            |     |
| Semester of study                           | 7  |  | ECTS credits  |                                     | 1.0   |            |     |
| Learning profile                            | general academic profile   |  | Assessment form   |                                     | assessment  |            |     |
| Conducting unit                             | Department of Solid State Physics -> Faculty of Applied Physics and Mathematics  |  |   |                                     |   |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   |  | dr hab. inż. Aleksandra Mielewczyk-Gryń   |                                     |   |            |     |
|   | Teachers   |  | dr hab. inż. Aleksandra Mielewczyk-Gryń   |                                     |   |            |     |
| Lesson types and methods of instruction     | Lesson type  | Lecture  | Tutorial  | Laboratory                          | Project   | Seminar    | SUM |
|   | Number of study hours  | 15.0   | 0.0   | 0.0                                 | 0.0   | 0.0        | 15  |
|   | 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  | 15   |   | 0.0                                 |   | 0.0        | 15  |
| Subject objectives                          | The aim of a class is to present students the different applications of nanotechnology methods e.g. history or biology.  |  |   |                                     |   |            |     |
| Learning outcomes                           | Course outcome   |  | Subject outcome   |                                     | Method of verification  |            |     |
|   | K6_W07   |  | Has knowledge of nanotechnology methods used in other fields of science.  |                                     | [SW2] Assessment of knowledge contained in presentation<br>[SW3] Assessment of knowledge contained in written work and projects |            |     |
|   | K6_W06   |  | Has knowledge of the physical and chemical foundations of nanotechnology necessary to analyze the results of experimental measurements. |                                     | [SW1] Assessment of factual knowledge   |            |     |
| Subject contents                            | <div><ul style="list-style-type: none"><li>• Calorimetry</li><li>• Microscopy</li><li>• Resonance methods</li><li>• Spectroscopic methods</li><li>• Ion scattering methods</li><li>• Electrochemical methods</li></ul></div> |  |   |                                     |   |            |     |
| Prerequisites and co-requisites             |  |  |   |                                     |   |            |     |
| Assessment methods and criteria             | Subject passing criteria   |  | Passing threshold   |                                     | Percentage of the final grade   |            |     |
|   | Test   |  | 51.0%   |                                     | 50.0%   |            |     |
|   | Essay  |  | 51.0%   |                                     | 50.0%   |            |     |
| Recommended reading                         | Basic literature   |  | Experimental Methods in the Physical Sciences   |                                     |   |            |     |

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|  | Supplementary literature   | <p>scientific papers eg:</p> <p><a href="#">J Biomol Tech</a>. 2010 Dec; 21(4): 167193.</p> <p>Hyperfine Interactions 154: 159176, 2004</p> <p><a href="#">Proc Natl Acad Sci U S A</a>. 2013 Apr 23; 110(17): 66516656</p>  |
|  | eResources addresses   | <p>Adresy na platformie eNauczanie:</p> <p>Metody badawcze nanotechnologii w innych dziedzinach nauki i techniki - Moodle ID: 33125</p> <p><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33125">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33125</a></p> |
| Example issues/<br>example questions/<br>tasks being completed | <ul style="list-style-type: none"> <li>- Proteins denaturation analysis.</li> <li>- Microscopy in archeology.</li> <li>- photoelectric effect and it's applications</li> </ul> |  |
| Work placement   | Not applicable   |  |