

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          |                                         |                                     |                                                                                                                                                |            |     |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Prototyping and elements of technological process design, PG_00134600                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Field of study                              | Chemistry                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Academic year of realisation of subject |                                     | 2026/2027                                                                                                                                      |            |     |
| Education level                             | Master's studies                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          | Subject group                           |                                     | Obligatory subject group in the field of study<br>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                               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | Language of instruction                 |                                     | Polish                                                                                                                                         |            |     |
| Semester of study                           | 3                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | ECTS credits                            |                                     | 1.0                                                                                                                                            |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | Assessment form                         |                                     | credit                                                                                                                                         |            |     |
| Conducting unit                             | Laboratory of Photocatalysis -> Department of Environmental Technology -> Faculty of Chemistry -> Rector                                                                                                                                                                                                                                                                                                                             |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                          | dr inż. Joanna Nadolna                  |                                     |                                                                                                                                                |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                                         |                                     |                                                                                                                                                |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                                          | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                                                                                        | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                                | 0.0                                                      | 0.0                                     | 15.0                                | 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                                                       |                                         | 2.0                                 |                                                                                                                                                | 8.0        | 25  |
| Subject objectives                          | <ul style="list-style-type: none"><li>• Familiarizing students with intellectual property issues,</li><li>• Introducing students to the process of writing a patent application, including patent claims,</li><li>• Introducing students to the concept of design thinking,</li><li>• Familiarizing students with ways of presenting their own ideas,</li><li>• Familiarizing students with elements of technology design.</li></ul> |                                                          |                                         |                                     |                                                                                                                                                |            |     |

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| Learning outcomes                                              | Course outcome                                                                                                                                  | Subject outcome                                                                                                                                                                                                                                                               | Method of verification                                  |
|                                                                | [CHEMMU2_K02] Is able to undertake a variety of roles in the team, including supervisory ones.                                                  | The student understands the need for teamwork.                                                                                                                                                                                                                                | [SK8] observation of student's independent or team work |
|                                                                | [CHEMMU2_U01] Plans and implements chemical experiments of medium complexity.                                                                   | Plans and carries out experiments to produce a product designed by themselves on a laboratory scale.                                                                                                                                                                          | [SU2] presentation/project/paper/report                 |
|                                                                | [CHEMMU2_W08] Demonstrates knowledge of theoretical computational and IT methods used to solve problems in chemistry.                           | The student is able to perform a material balance for the designed product.                                                                                                                                                                                                   | [SW2] presentation/project/paper/report                 |
|                                                                | [CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so. | The student understands the importance of systematically familiarizing themselves with the latest chemical literature (including patents and articles from scientific and popular science journals). They also understand the need for deepening interdisciplinary knowledge. | [SK8] observation of student's independent or team work |
|                                                                | [CHEMMU2_W06] Applies mathematics to the extent necessary to understand, describe and model chemical processes of medium complexity.            | The student is able to perform a material balance for the designed product.                                                                                                                                                                                                   | [SW2] presentation/project/paper/report                 |
| Subject contents                                               | • Development of technology and prototyping of the designed product.                                                                            |                                                                                                                                                                                                                                                                               |                                                         |
| Prerequisites and co-requisites                                | Basic knowledge of English.                                                                                                                     |                                                                                                                                                                                                                                                                               |                                                         |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                        | Passing threshold                                                                                                                                                                                                                                                             | Percentage of the final grade                           |
|                                                                | Project                                                                                                                                         | 51.0%                                                                                                                                                                                                                                                                         | 100.0%                                                  |
| Recommended reading                                            | Basic literature                                                                                                                                | • Unpublished materials provided to students during classes.<br>• Patent descriptions of selected technologies. The patent descriptions will be sourced from free patent databases.                                                                                           |                                                         |
|                                                                | Supplementary literature                                                                                                                        | no                                                                                                                                                                                                                                                                            |                                                         |
|                                                                | eResources addresses                                                                                                                            |                                                                                                                                                                                                                                                                               |                                                         |
| Example issues/<br>example questions/<br>tasks being completed |                                                                                                                                                 |                                                                                                                                                                                                                                                                               |                                                         |
| Work placement                                                 | Not applicable                                                                                                                                  |                                                                                                                                                                                                                                                                               |                                                         |

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