



## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                           |                                                          |                                         |                                     |                                                |            |     |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|------------------------------------------------|------------|-----|
| Subject name and code                       | ORGANIC PREPARATIONS, PG_00064412                                                                                                                                                                                                                                                                                                                                         |                                                          |                                         |                                     |                                                |            |     |
| Field of study                              | Chemistry                                                                                                                                                                                                                                                                                                                                                                 |                                                          |                                         |                                     |                                                |            |     |
| Date of commencement of studies             | October 2026                                                                                                                                                                                                                                                                                                                                                              |                                                          | Academic year of realisation of subject |                                     | 2028/2029                                      |            |     |
| Education level                             | first-cycle studies                                                                                                                                                                                                                                                                                                                                                       |                                                          | Subject group                           |                                     | Obligatory subject group in the field of study |            |     |
| Mode of study                               | Full-time studies                                                                                                                                                                                                                                                                                                                                                         |                                                          | Mode of delivery                        |                                     | at the university                              |            |     |
| Year of study                               | 3                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Language of instruction                 |                                     | Polish                                         |            |     |
| Semester of study                           | 6                                                                                                                                                                                                                                                                                                                                                                         |                                                          | ECTS credits                            |                                     | 7.0                                            |            |     |
| Learning profile                            | general academic profile                                                                                                                                                                                                                                                                                                                                                  |                                                          | Assessment form                         |                                     | assessment                                     |            |     |
| Conducting unit                             | Department of Organic Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology                                                                                                                                                                                                                                                                   |                                                          |                                         |                                     |                                                |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                        |                                                          | dr hab. inż. Teresa Olszewska           |                                     |                                                |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                  |                                                          |                                         |                                     |                                                |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                               | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                        | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                     | 0.0                                                      | 0.0                                     | 105.0                               | 0.0                                            | 0.0        | 105 |
|                                             | 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                                                                                                                                                                                                                                                                                                                                                     | 105                                                      |                                         | 5.0                                 |                                                | 65.0       | 175 |
| Subject objectives                          | The aim of the course is to provide students with practical skills in organic synthesis and in the purification and identification of organic compounds, and to develop their ability to plan, conduct, and document experiments involving the synthesis, isolation, purification, and identification of organic compounds while adhering to laboratory safety protocols. |                                                          |                                         |                                     |                                                |            |     |

| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                           | Subject outcome                                                                                                                                                                                                                                                                                                                                                                                                                        | Method of verification                                                                      |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
|                                 | [K6_K03] is aware of the importance of caring for the quality and diligence of the tasks performed, being responsible for their consequences                                                                                                                                             | The student recognizes the importance of the reliable execution of experiments, accurate measurement and weighing of reagents, strict adherence to process parameters, careful observation at every stage of a synthesis, and comprehensive documentation of experimental procedures in a laboratory notebook.                                                                                                                         | [SK2] Assessment of progress of work                                                        |
|                                 | [K6_U09] is able to recognise hazards, counteract them and work with chemical reagents and basic technical apparatus in accordance with health and safety principles and the concept of sustainability                                                                                   | The student is able to safely handle chemicals and operate the basic equipment and apparatus used in an organic chemistry laboratory. The student is able to select appropriate procedures for the segregation and disposal of chemical waste generated during organic syntheses. The student recognizes the importance of green chemistry principles and is prepared to use less hazardous solvent alternatives whenever appropriate. | [SU3] Assessment of ability to use knowledge gained from the subject                        |
|                                 | [K6_U07] is able to undertake accurate and precise analytical measurements, to synthesise simple and large-molecular chemical compounds, to purify and analyse their composition and to determine their structure using classical and instrumental methods                               | They can synthesize simple organic compounds, isolate and purify the products obtained, and identify them using appropriate analytical techniques. They are able to confirm the structures of the synthesized compounds on the basis of their physicochemical properties and classical instrumental methods of analysis.                                                                                                               | [SU1] Assessment of task fulfilment<br>[SU4] Assessment of ability to use methods and tools |
|                                 | [K6_U01] gathers information from literature, databases and other sources, interpreting, critically evaluating, summarising, formulating and justifying opinions, independently analyses and produces technical drawings with the use of computer assistance                             | The student is able to obtain from the scientific literature and other sources information on alternative synthetic procedures for a given compound, as well as the data required to confirm the structure of the product obtained. The student is prepared to critically evaluate and analyze experimental results and draw appropriate conclusions when an experiment is unsuccessful.                                               | [SU4] Assessment of ability to use methods and tools                                        |
| Subject contents                | <p>Course content – laboratory</p> <p>Performing single-step and multistep syntheses of selected organic compounds representing different classes of organic substances, using a variety of synthetic operations and techniques. Confirming the structures of the products obtained.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                             |
| Prerequisites and co-requisites | Successful completion of Organic Chemistry I and II (lectures and laboratory classes).                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                             |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                 | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                      | Percentage of the final grade                                                               |
|                                 | total points for the preparation of laboratory experiments, successfully completing pre-laboratory assessments prior to performing the syntheses, and passing a test covering the required preliminary knowledge.                                                                        | 60.0%                                                                                                                                                                                                                                                                                                                                                                                                                                  | 100.0%                                                                                      |

|                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>1) A. I. Vogel <i>Preparatyka organiczna</i> wydanie drugie, Wydawnictwo Naukowo-Techniczne, Warszawa 1984.</p> <p>2) J. Gawroński, K. Gawrońska, K. Kacprzak, M. Kwit <i>Współczesna synteza organiczna</i>, WN PWN Warszawa 2004</p> <p>3) L. M. Harwood, C. J. Moody, J. M. Percy <i>Experimental Organic Chemistry Standard and Microscale</i>, 2-nd ed, Blackwell Science Ltd, 1999</p> <p>4) K. Dzierzbicka, J. Rachoń, D. Witt <i>Preparatyka związków organicznych. Ćwiczenia laboratoryjne</i>. Wydawnictwo Politechniki Gdańskiej, Gdańsk 2011.</p> |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>1) J. Wróbel <i>Preparatyka i elementy syntezy organicznej</i></p> <p>2) M. Mąkosza <i>Synteza organiczna</i></p> <p>3) B. Bochwic <i>Preparatyka organiczna</i></p>                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Example issues/<br>example questions/<br>tasks being completed | <p>1. Specify the temperature range over which an oil bath can be used to heat a reaction mixture.</p> <p>2. Which drying agent would you use to dry an ethereal solution of aniline after it has been extracted from an aqueous phase?</p> <p>3. What methods can be used to break an emulsion formed during liquid-liquid extraction?</p> <p>4. Describe how to prepare 100 mL of a 4 M aqueous potassium hydroxide solution. Specify the mass of KOH and the volume of water to be used.</p> <p>5. Calculate the volumes of water and concentrated hydrochloric acid (<math>d = 1.18 \text{ g/cm}^3</math>) needed to prepare: a) 50 mL of a 3 M aqueous HCl solution b) 18 mL of a 12% (w/w) HCl solution.</p> <p>6. State whether the precipitate obtained after crystallization should be filtered through a glass funnel or a Büchner funnel, and justify your answer.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Practical activities within the subject                        | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

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