

## Subject card

|                                             |                                                                                                                                                                                  |                                                          |                                         |                                     |         |                                                                                                                                                |     |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|---------|------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Subject name and code                       | Chemistry of polymers, PG_00082045                                                                                                                                               |                                                          |                                         |                                     |         |                                                                                                                                                |     |
| Field of study                              | Chemistry                                                                                                                                                                        |                                                          |                                         |                                     |         |                                                                                                                                                |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                     |                                                          | Academic year of realisation of subject |                                     |         | 2027/2028                                                                                                                                      |     |
| Education level                             | Bachelor'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                               | 3                                                                                                                                                                                |                                                          | Language of instruction                 |                                     |         | Polish                                                                                                                                         |     |
| Semester of study                           | 5                                                                                                                                                                                |                                                          | ECTS credits                            |                                     |         | 1.0                                                                                                                                            |     |
| Learning profile                            | academic                                                                                                                                                                         |                                                          | Assessment form                         |                                     |         | credit                                                                                                                                         |     |
| Conducting unit                             |                                                                                                                                                                                  |                                                          |                                         |                                     |         |                                                                                                                                                |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                               |                                                          | prof. dr hab. Piotr Rekowski            |                                     |         |                                                                                                                                                |     |
|                                             | 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                          | 1. Polystyrene (PS) synthesis<br><br>2. Synthesis of styrene-divinylbenzene copolymer (PS-DVB)<br><br>3.Obtaining nylon thread (nylon 6.10)<br><br>4. Identification of plastics |                                                          |                                         |                                     |         |                                                                                                                                                |     |

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|----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Learning outcomes                                              | Course outcome                                                                                                                             | Subject outcome                                                                                                                                                                                                                                                                                                                                                  | Method of verification                                                                                  |
|                                                                | [CHEML3_U09] Is able to learn independently.                                                                                               | 1. uses chemical terminology to the extent necessary to present(both in oral and written form) the content presented in the course;                                                                                                                                                                                                                              | [SU1] oral statement/conversation/discussion<br>[SU8] observation of student's independent or team work |
|                                                                | [CHEML3_U08] Presents in an understandable way the basic facts about chemistry using a scientific language typical of chemical sciences.   | 1. illustrates polymerization stages by chemical reactions,<br>2. characterizes methods of radical, ionic and coordination polymerizations<br>3. describes the polyaddition and polycondensation                                                                                                                                                                 | [SU1] oral statement/conversation/discussion<br>[SU3] text preparation/written work                     |
|                                                                | [CHEML3_U01] Identifies, analyses and solves problems in the field of broadly understood chemistry on the basis of the acquired knowledge. | 1. shows the structure of the commonly used synthetic polymers<br>2. uses basic descriptions of polymer microstructures<br>3. provides for some physicochemical properties (eg glass transition temperature) of polymers depending on their chemical structure and microstructure                                                                                | [SU1] oral statement/conversation/discussion<br>[SU3] text preparation/written work                     |
|                                                                | [CHEML3_W03] Explains the relationship between the structure of matter and its observed properties.                                        | 1. defines the basic principles of polymer chemistry<br>2. analyzes and evaluates the influence of some polymers on the natural environment                                                                                                                                                                                                                      | [SW1] oral statement/conversation/discussion<br>[SW3] text preparation/written work                     |
| Subject contents                                               | Issues related to the synthesis of polymers (polystyrene and nylon 6.10) and physicochemical identification of polymers                    |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                         |
| Prerequisites and co-requisites                                | Passed organic chemistry exam                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                         |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                   | Passing threshold                                                                                                                                                                                                                                                                                                                                                | Percentage of the final grade                                                                           |
|                                                                | Synthesis and analysis reports                                                                                                             | 51.0%                                                                                                                                                                                                                                                                                                                                                            | 80.0%                                                                                                   |
|                                                                | Activity and commitment during laboratory exercises                                                                                        | 0.0%                                                                                                                                                                                                                                                                                                                                                             | 20.0%                                                                                                   |
| Recommended reading                                            | Basic literature                                                                                                                           | Literature required to pass the course: Rabek J.F., Współczesna wiedza o polimerach, PWN 2008 Pieluchowski J., Puszyński A., Chemia Polimerow Wydawnictwo AGH, Kraków 1998 Walton D., Lorimer P., Polymers, Oxford University Press 2001 Stevens M.P., Polymer Chemistry, Oxford University Press, 1999 Monographic works provided by assistants leading classes |                                                                                                         |
|                                                                | Supplementary literature                                                                                                                   | Various academic handbooks concerning polymer chemistry                                                                                                                                                                                                                                                                                                          |                                                                                                         |
|                                                                | eResources addresses                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                         |
| Example issues/<br>example questions/<br>tasks being completed | Issues related to the synthesis of polymers (polystyrene and nylon 6.10) and physicochemical identification of polymers                    |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                         |
| Work placement                                                 | Not applicable                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                         |

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