GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

| | | | |
|---|---|---|---|
| Subject name and code | Chemistry IV, PG_00048932 | | |
| Field of study | Materials Engineering, Materials Engineering, Materials Engineering, Materials Engineering | | |
| Date of commencement of studies | October 2020 | Academic year of realisation of subject | 2021/2022 |
| Education level | first-cycle studies | Subject group | Obligatory subject group in the field of study<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 | 4 | ECTS credits | 4.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Department of Polymers Technology -> Faculty of Chemistry | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | dr hab. inż. Justyna Kucińska-Lipka | |
| | Teachers | dr hab. inż. Justyna Kucińska-Lipka<br>dr inż. Paulina Parcheta-Szwindowska<br>dr inż. Łukasz Zedler<br>Adam Olszewski<br>dr inż. Marcin Włoch<br>dr inż. Paulina Kosmela<br>dr hab. inż. Michał Strankowski<br>dr inż. Maciej Sienkiewicz | |

**Lesson types and methods of instruction**

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

E-learning hours included: 0.0

Adresy na platformie eNauczanie:
2022 Chemia IV (PG_00048932)-Nowy - Moodle ID: 22619
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22619

Additional information:

**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 | 10.0 | 45.0 | 100 |

**Subject objectives**

The aim of the course is to acquaint the student with the basics of the chemical structure of specific groups of polymers of practical importance, the methods of their preparation and the basic properties.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| K6_U01 | The student is able to use analytical methods and devices that enable the measurement of basic quantities characterizing materials and synthesis processes. | [SU4] Assessment of ability to use methods and tools |
| K6_W02 | The student has knowledge of physics and chemistry useful for solving problems related to the synthesis of polymers and the interpretation of their properties. | [SW1] Assessment of factual knowledge |
| K6_U05 | The student prepares theoretically for classes | [SU2] Assessment of ability to analyse information |
| K6_K01 | The student knows how to raise his own competences and knows when to turn to experts for help, is able to properly define priorities for the implementation of tasks set by himself or other. | [SK5] Assessment of ability to solve problems that arise in practice |

**Subject contents**

Basic concepts: monomers, oligomers, homopolymers, copolymers, terpolymers, polymer materials. Division of monomers and polymers. Types of polyreaction. Radical polymerization, initiators and chemical reactions taking place in the processes of chain initiation, growth and termination - kinetics. Polymers produced according to radical polymerization. Anionic polymerization of selected monomers. Polymers produced in anionic polymerization. Condensation polymerization: homopolycondensation, heteropolycondensation, copolycondensation and cross-linking polycondensation. Chemical reactions taking place in polycondensation processes leading to the obtaining of polymers of practical use.

**Prerequisites and co-requisites**

There are no requirements.

**Assessment methods and criteria**

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| written colloquium | 60.0% | 60.0% |
| laboratory | 100.0% | 40.0% |

**Recommended reading**

| | |
|---|---|
| Basic literature | Collective work edited by Z. Florjańczyk and S. Penczek: Chemistry of polymers, t1- Macromolecules and methods of their preparation, Oficyna Wydnicza Politechniki Warszawskiej, Warsaw 1995. Pielichowski J., Puszyński A .: Chemistry of polymers, WNT Kraków 2004 |
| Supplementary literature | W. C., Callister, Jr.: Materials Science & Engineering, 3rd Edition, John Wiley & Sons, New York 1994 |
| eResources addresses | 2022 Chemia IV (PG_00048932)-Nowy - Moodle ID: 22619 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=22619 |

**Example issues/ example questions/ tasks being completed**

1. What are polymers?

2. What is the difference between the polycondensation reaction and the polyaddition reaction?

3. How are monomers divided?

4. Obtain the selected polymer by at least two methods.

**Work placement**

Not applicable