GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

| | | | |
|---|---|---|---|
| Subject name and code | Diploma laboratories II, PG_00066091 | | |
| Field of study | Chemistry | | |
| Date of commencement of studies | February 2025 | Academic year of realisation of subject | 2025/2026 |
| Education level | second-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 | 2 | Language of instruction | Polish |
| Semester of study | 3 | ECTS credits | 5.0 |
| Learning profile | general academic profile | Assessment form | assessment |
| Conducting unit | Department of Analytical Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | prof. dr hab. inż. Agata Kot-Wasik | |
| | Teachers | | |

**Lesson types**

| Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
|---|---|---|---|---|---|---|
| Number of study hours | 0.0 | 0.0 | 75.0 | 0.0 | 0.0 | 75 |

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 | 75 | 10.0 | 40.0 | 125 |

**Subject objectives**

The aim of the course is to prepare the student to complete a diploma thesis, in particular by developing the skills of formulating research problems, planning and conducting research (experimental or design), analyzing and interpreting results and presenting them in written and oral form.

**Learning outcomes**

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [K7_W04] indicates methods for the synthesis of chemical compounds with defined properties | is able to indicate appropriate methods for the analysis of chemical compounds with specific properties and justify their choice. | [SW3] Assessment of knowledge contained in written work and projects |
| [K7_U03] plans and performs the synthesis of chemical compounds with the required properties | is able to independently plan and carry out the analysis of chemical compounds with specific properties, selecting appropriate methods. | [SU4] Assessment of ability to use methods and tools |
| [K7_U05] analyzes the functioning of devices, equipment and technological lines used in laboratories and the chemical industry | is able to analyze the properties and composition of chemical compounds used in laboratories and the chemical industry, using appropriate methods and analytical equipment. | [SU2] Assessment of ability to analyse information |
| [K7_U02] prepares detailed documentation of the results of independently conducted experiments and analyzes the obtained results, uses professional vocabulary with understanding and prepares and communicates information | is able to prepare documentation of the results of their own experiments, analyze the obtained data and use professional vocabulary to present and convey information. | [SU5] Assessment of ability to present the results of task |

**Subject contents**

Course content – laboratory
The student independently conducts experiments using modern high-performance liquid chromatography (HPLC) and ultra-high-speed liquid chromatography (UPLC). Practical sessions include selecting appropriate methods and instrument parameters, preparing and stabilizing the chromatographic column. Particular attention is paid to the influence of temperature, mobile phase flow rate, and column sorbent grain size on separation efficiency and analysis time. The student interprets chromatograms, identifies and quantifies mixture components, and prepares full documentation of results in accordance with laboratory standards.

**Prerequisites and co-requisites**

Basic knowledge from analytical chemistry.

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>The final grade for the subject is determined on the basis of participation in laboratory classes – that is, activity, independence in performing experiments, compliance with health and safety regulations and correct execution of procedures.</td><td>60.0%</td><td>100.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>The LC Handbook - Guide to LC Columns and Method Development - Agilent Technologies (https://www.agilent.com/cs/library/primers/public/LC-Handbook-Complete-2.pdf)</td></tr>
<tr><td>Supplementary literature</td><td>Practical High-Performance Liquid Chromatography FIFTH EDITION - Veronika R. Meyer, Wiley 2010</td></tr>
<tr><td>eResources addresses</td><td>Basic<br>https://chemia.ug.edu.pl/sites/default/files/_nodes/strona-chemia/17399/files/slady_hplc.pdf - Basic knowledge - HPLC.<br>https://chemia.ug.edu.pl/sites/default/files/_nodes/strona-chemia/33587/files/techniki_separacyjne.pdf - Separation techniques - description, mechanisms.</td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">During the Diploma Laboratory, the student participates in selected webinars and online training courses on modern HPLC techniques, which allows them to deepen their theoretical and practical knowledge and learn about the latest trends and methods in chromatographic analysis.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
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