

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          |                                         |                                     |                                                |            |     |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|------------------------------------------------|------------|-----|
| Subject name and code                       | Chemical Safety, PG_00188260                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |                                         |                                     |                                                |            |     |
| Field of study                              | Bezpieczeństwo pracy z chemikaliami (Wykład)                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          |                                         |                                     |                                                |            |     |
| Date of commencement of studies             | October 2026                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                          | Academic year of realisation of subject |                                     | 2026/2027                                      |            |     |
| Education level                             | Bachelor's 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                               | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | Language of instruction                 |                                     | Polish                                         |            |     |
| Semester of study                           | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | ECTS credits                            |                                     | 2.0                                            |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Assessment form                         |                                     | credit                                         |            |     |
| Conducting unit                             | Department of Molecular Biochemistry -> Faculty of Chemistry -> Rector                                                                                                                                                                                                                                                                                                                                                                                           |                                                          |                                         |                                     |                                                |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                          | dr Natalia Ptaszyńska                   |                                     |                                                |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          |                                         |                                     |                                                |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                        | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                                                            | 15.0                                                     | 0.0                                     | 0.0                                 | 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                                                       |                                         | 10.0                                |                                                | 25.0       | 50  |
| Subject objectives                          | <ul style="list-style-type: none"><li>Familiarize students with the principles of safe practices in chemical and biological laboratories.</li><li>Provide a comprehensive overview of procedures for handling hazardous and infectious materials.</li><li>Introduce quality assurance systems applied in analytical and forensic laboratories.</li><li>Develop an understanding of legal and ethical responsibilities associated with laboratory work.</li></ul> |                                                          |                                         |                                     |                                                |            |     |

| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Subject outcome                                                                                                                                                                                                                                                                                                                                                       | Method of verification                                                          |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
|                                 | [AKRL3_U04] The graduate is able to select appropriate equipment for experiments and prepare reports and expert opinions based on analytical results in compliance with legal and ethical standards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | The student is able to select appropriate equipment and materials for conducting experiments involving chemical substances and prepare reports and expert opinions based on analytical results, in compliance with legal requirements and professional ethical standards.                                                                                             | [SU4] test/egzamin - ustny lub pisemny<br>[SU5] realizacja zadania problemowego |
|                                 | [AKRL3_W07] The graduate knows and understands the principles of quality assurance in analytical and forensic laboratories.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | The student understands the principles of quality assurance in analytical and forensic laboratories and is able to apply basic control procedures to maintain the reliability of results and compliance with quality standards.                                                                                                                                       | [SW4] test/egzamin - ustny lub pisemny                                          |
|                                 | [AKRL3_W10] The graduate knows and understands the principles of safe work in chemical and biological laboratories, including procedures for handling hazardous and infectious materials.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | he student demonstrates the ability to apply occupational health and safety principles during laboratory work involving chemical substances. This includes identifying potential hazards, selecting and using appropriate personal protective equipment, and effectively responding to emergency situations to ensure both personal safety and the safety of others.  | [SW4] test/egzamin - ustny lub pisemny<br>[SW5] realizacja zadania problemowego |
|                                 | [AKRL3_K06] The graduate is ready to follow occupational health and safety regulations in the laboratory and care for the safety of themselves and others.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | The student demonstrates the ability to apply occupational health and safety principles during laboratory work involving chemical substances. This includes identifying potential hazards, selecting and using appropriate personal protective equipment, and responding effectively to emergency situations to ensure both personal safety and the safety of others. | [SK5] realizacja zadania problemowego                                           |
| Subject contents                | 1. Introduction to Occupational Health and Safety in Chemical and Biological Laboratories regulations, standards, responsibilities.<br><br>2. Identification of Chemical and Biological Hazards substance classification, labeling, safety data sheets (SDS).<br><br>3. Procedures for Handling Hazardous and Infectious Materials storage, transport, disposal, emergency response.<br><br>4. Personal and Collective Protective Measures equipment selection, working in fume hoods and laminar flow cabinets.<br><br>5. Quality Assurance Systems in Laboratories ISO standards, accreditation, method validation, documentation.<br><br>6. Legal and Ethical Aspects of Laboratory Work criminal and civil liability, ethics in forensic analysis. |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                 |
| Prerequisites and co-requisites | <ul style="list-style-type: none"> <li>• Basic knowledge of general chemistry and properties of chemical substances.</li> <li>• Fundamentals of biology and microbiology related to laboratory hazards.</li> <li>• Familiarity with general occupational health and safety principles.</li> <li>• Ability to interpret Material Safety Data Sheets (MSDS) and hazard symbols.</li> <li>• Basic skills in handling standard laboratory equipments.</li> </ul>                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                       |                                                                                 |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Passing threshold                                                                                                                                                                                                                                                                                                                                                     | Percentage of the final grade                                                   |
|                                 | Individual assignment or essay                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 51.0%                                                                                                                                                                                                                                                                                                                                                                 | 20.0%                                                                           |
|                                 | Written exam or test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 51.0%                                                                                                                                                                                                                                                                                                                                                                 | 80.0%                                                                           |

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| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"> <li>• PN-EN ISO/IEC 17025:2018 General requirements for the competence of testing laboratories.</li> <li>• Regulation of the Minister of Health on occupational health and safety when working with chemical substances.</li> <li>• Textbooks on toxicology and laboratory safety: e.g.</li> <li>• Basic Principles of Laboratory Safety in Chemical Laboratories G. Kupryszewski</li> <li>• <i>Casarett &amp; Doulls Toxicology: The Basic Science of Poisons</i> Curtis D. Klaassen.</li> <li>• <i>Principles of Laboratory Safety</i> Susan L. Morris.</li> <li>• <i>Handbook of Chemical Safety</i> Richard J. Lewis.</li> <li>• <i>Forensic Science: From the Crime Scene to the Crime Lab</i> Richard Saferstein.</li> </ul> |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>• Teaching materials provided by the instructor.</li> <li>• Current regulations concerning chemical and biological substances.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Example issues/<br>example questions/<br>tasks being completed | <ul style="list-style-type: none"> <li>• Basic occupational health and safety regulations in chemical and biological laboratories.</li> <li>• Classification of hazardous substances (GHS, CLP) and the meaning of pictograms.</li> <li>• Principles of storage and transport of chemical substances.</li> <li>• Emergency procedures in case of spills or contamination.</li> <li>• Personal and collective protective measures selection and application.</li> <li>• Quality assurance systems in laboratories (ISO 17025, accreditation).</li> <li>• Chemical waste management segregation, neutralization, disposal.</li> <li>• Legal and ethical responsibility in laboratory work.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

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