

**Subject card**

|                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                          |                     |                                     |                        |            |     |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------|-------------------------------------|------------------------|------------|-----|
| <b>Subject name and code</b>                       | Click, think, discover: online tools and AI in science, PG_00179616                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                     |                                     |                        |            |     |
| <b>Field of study</b>                              | Chemistry                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                     |                                     |                        |            |     |
| <b>Date of commencement of studies</b>             | October 2026                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <b>Academic year of realisation of subject</b>           |                     |                                     | 2027/2028              |            |     |
| <b>Education level</b>                             | Master's studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Subject group</b>                                     |                     |                                     | Optional subject group |            |     |
| <b>Mode of study</b>                               | full-time studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Mode of delivery</b>                                  |                     |                                     | at the university      |            |     |
| <b>Year of study</b>                               | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>Language of instruction</b>                           |                     |                                     | English                |            |     |
| <b>Semester of study</b>                           | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>ECTS credits</b>                                      |                     |                                     | 3.0                    |            |     |
| <b>Learning profile</b>                            | academic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Assessment form</b>                                   |                     |                                     | credit                 |            |     |
| <b>Conducting unit</b>                             | Laboratory of Medical Chemistry -> Department of Biomedical Chemistry -> Faculty of Chemistry -> Rector                                                                                                                                                                                                                                                                                                                                                                                         |                                                          |                     |                                     |                        |            |     |
| <b>Name and surname of lecturer (lecturers)</b>    | <b>Subject supervisor</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          | dr Marta Orlikowska |                                     |                        |            |     |
|                                                    | <b>Teachers</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                          |                     |                                     |                        |            |     |
| <b>Lesson types</b>                                | <b>Lesson type</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Lecture                                                  | Tutorial            | Laboratory                          | Project                | Seminar    | SUM |
|                                                    | <b>Number of study hours</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 0.0                                                      | 0.0                 | 22.0                                | 0.0                    | 0.0        | 22  |
|                                                    | E-learning hours included: 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          |                     |                                     |                        |            |     |
| <b>Learning activity and number of study hours</b> | <b>Learning activity</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Participation in didactic classes included in study plan |                     | Participation in consultation hours |                        | Self-study | SUM |
|                                                    | <b>Number of study hours</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 22                                                       |                     | 5.0                                 |                        | 48.0       | 75  |
| <b>Subject objectives</b>                          | The aim of the course is to introduce students to modern online tools and artificial intelligence technologies used in contemporary scientific research. Students will learn how to effectively utilize digital resources, applications, and platforms that support research processes, data analysis, and scientific communication. The course focuses on developing critical thinking skills, evaluating the credibility of sources, and applying AI tools in various scientific disciplines. |                                                          |                     |                                     |                        |            |     |

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| Learning outcomes                                                                                                                                                                                    | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Subject outcome                                                                                                                                                                                                                                               | Method of verification                                                                                                                       |
|                                                                                                                                                                                                      | [CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | The student demonstrates in-depth knowledge of current trends in the development of chemistry and recent scientific discoveries, with particular emphasis on the role of digital tools and artificial intelligence in shaping the future of chemical research | [SW2] presentation/project/paper/report<br>[SW5] implementation of a problem task                                                            |
|                                                                                                                                                                                                      | [CHEMMU2_K03] Understands the need for systematic work on various projects of a long-term nature and knows how to set priorities for the implementation of undertaken tasks.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | The student understands the importance of systematic work on long-term research projects and is able to set priorities and effectively plan tasks using digital tools that support project management and scientific work organization.                       | [SK2] presentation/project/paper/report<br>[SK5] implementation of a problem task<br>[SK8] observation of student's independent or team work |
|                                                                                                                                                                                                      | [CHEMMU2_U06] Presents the results of scientific discoveries in chemistry and related disciplines in an understandable way.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | The student is able to clearly and accessibly present scientific findings from chemistry and related disciplines using modern digital tools, data visualization techniques, and AI-supported solutions.                                                       | [SU2] presentation/project/paper/report<br>[SU5] implementation of a problem task<br>[SU8] observation of student's independent or team work |
|                                                                                                                                                                                                      | [CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | The student is able to apply acquired knowledge from chemistry and related scientific disciplines when using digital tools and artificial intelligence technologies to support data analysis, interpretation of results, and solving research problems        | [SU2] presentation/project/paper/report<br>[SU5] implementation of a problem task<br>[SU8] observation of student's independent or team work |
| [CHEMMU2_U08] Prepares and presents oral presentations in various fields of chemistry in Polish and English, using acquired knowledge and skills as well as basic sources of scientific information. | The student is able to search for, evaluate, and apply modern online tools and artificial intelligence technologies to support research and presentation tasks in the field of chemistry and related sciences; is capable of integrating diverse scientific information sources in both Polish and English and using them to prepare oral presentations and written assignments.                                                                                                                                                                                                                                                                                                                                                                                                                        | [SU2] presentation/project/paper/report<br>[SU5] implementation of a problem task<br>[SU8] observation of student's independent or team work                                                                                                                  |                                                                                                                                              |
| Subject contents                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>Scientific data visualization (tools for creating charts, infographics, and presentations, including at least BioRender; creating attractive presentations of research results)</li> <li>Searching for and evaluating scientific information (critical analysis of sources, recognizing reliable publications and authors)</li> <li>Artificial intelligence in scientific research (applications of AI in the analysis of chemical and biological data)</li> <li>Preparing and delivering scientific presentations (using AI to support language and editorial work; oral presentations utilizing multimedia and interactive tools)</li> <li>Ethics and responsible use of AI in science (limitations and risks of applying artificial intelligence).</li> </ul> |                                                                                                                                                                                                                                                               |                                                                                                                                              |
| Prerequisites and co-requisites                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |                                                                                                                                              |
| Assessment methods and criteria                                                                                                                                                                      | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Passing threshold                                                                                                                                                                                                                                             | Percentage of the final grade                                                                                                                |
|                                                                                                                                                                                                      | points for reports from laboratory exercises                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 51.0%                                                                                                                                                                                                                                                         | 100.0%                                                                                                                                       |
| Recommended reading                                                                                                                                                                                  | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Unpublished materials prepared by the course instructor.                                                                                                                                                                                                      |                                                                                                                                              |
|                                                                                                                                                                                                      | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Russell, S., Norvig, P.</b> <i>Artificial Intelligence: A Modern Approach</i> . Pearson, 2020.                                                                                                                                                             |                                                                                                                                              |
|                                                                                                                                                                                                      | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                               |                                                                                                                                              |
| Example issues/<br>example questions/<br>tasks being completed                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                               |                                                                                                                                              |
| Work placement                                                                                                                                                                                       | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                               |                                                                                                                                              |

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