



## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                          |                                                                                                                                                                  |                                     |                                                                                                                         |            |     |
|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | MYCOLOGY AND PARASITOLOGY MOLECULAR, PG_00065569                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          |                                                                                                                                                                  |                                     |                                                                                                                         |            |     |
| Field of study                              | Biotechnology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                          |                                                                                                                                                                  |                                     |                                                                                                                         |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          | Academic year of realisation of subject                                                                                                                          |                                     | 2026/2027                                                                                                               |            |     |
| Education level                             | second-cycle studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                          | Subject group                                                                                                                                                    |                                     | Optional subject group<br>Specialty 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<br>-                                                                                                             |            |     |
| Semester of study                           | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | ECTS credits                                                                                                                                                     |                                     | 3.0                                                                                                                     |            |     |
| Learning profile                            | general academic profile                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          | Assessment form                                                                                                                                                  |                                     | assessment                                                                                                              |            |     |
| Conducting unit                             | Department of Biotechnology and Microbiology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                          |                                                                                                                                                                  |                                     |                                                                                                                         |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                          | dr hab. inż. Lucyna Holec-Gąsior                                                                                                                                 |                                     |                                                                                                                         |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                          | dr hab. inż. Lucyna Holec-Gąsior<br><br>dr inż. Martyna Mroczyńska-Szeląg                                                                                        |                                     |                                                                                                                         |            |     |
|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                          |                                                                                                                                                                  |                                     |                                                                                                                         |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Lecture                                                  | Tutorial                                                                                                                                                         | Laboratory                          | Project                                                                                                                 | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 30.0                                                     | 0.0                                                                                                                                                              | 30.0                                | 0.0                                                                                                                     | 0.0        | 60  |
|                                             | E-learning hours included: 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                                                                                                                                                  |                                     |                                                                                                                         |            |     |
|                                             | eNauczanie source addresses:<br>Moodle ID: 7004 MYKOLOGIA I PARAZYTOLOGIA MOLEKULARNA 2026/2027<br><a href="https://enauczanie.pg.edu.pl/2025/course/view.php?id=7004">https://enauczanie.pg.edu.pl/2025/course/view.php?id=7004</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                          |                                                                                                                                                                  |                                     |                                                                                                                         |            |     |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 60                                                       |                                                                                                                                                                  | 5.0                                 |                                                                                                                         | 25.0       | 90  |
| Subject objectives                          | The course aims to provide students with knowledge in the field of mycology and parasitology, covering the biology, taxonomy, diversity, and medical significance of fungi and parasites. It presents the most important human fungal infections and parasitic invasions, as well as methods for their diagnosis, with a particular focus on microscopic, serological, and molecular techniques. The course also discusses the application of molecular biology techniques in diagnostics and in studying the mechanisms of fungal resistance to antimycotics. Students will acquire practical skills in utilizing molecular biology techniques in mycology and parasitology, as well as in conducting independent and teamwork laboratory operations, including performing assays, as well as analyzing and processing the obtained results. |                                                          |                                                                                                                                                                  |                                     |                                                                                                                         |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | Subject outcome                                                                                                                                                  |                                     | Method of verification                                                                                                  |            |     |
|                                             | [K7_W01] defines the phenomena, processes and laws of living nature applied to the production of useful goods and the carrying out of services                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          | has knowledge of how to solve advanced problems and research tasks within the specialization, using tools applied in genetic engineering and molecular genetics. |                                     | [SW1] Assessment of factual knowledge                                                                                   |            |     |
|                                             | [K7_U05] proposes solutions to technological and scientific problems in biotechnology and related fields using experimental methods and bioinformatics, statistics and specialized databases                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                          | is able to rationally select research methods appropriate for a given task and optimize a diagnostic procedure protocol.                                         |                                     | [SU2] Assessment of ability to analyse information<br>[SU4] Assessment of ability to use methods and tools              |            |     |
|                                             | [K7_U02] uses research methods used in biotechnology and related fields                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          | is able to apply molecular research and diagnostic methods in the analysis of fungal and parasitic material.                                                     |                                     | [SU2] Assessment of ability to analyse information<br>[SU4] Assessment of ability to use methods and tools              |            |     |

|                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                          |                               |
|----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Subject contents                                         | Course content – lecture<br><br>Introduction to mycology. Fungal taxonomy – the impact of molecular biology development on fungal reclassification. Application of molecular biology methods in mycology. Molecular diagnostics of fungal infections. Molecular basis of fungal resistance to antimycotics (azoles and echinocandins). Gene expression analysis. Parasitism and other interspecies interactions. The place of parasites in the animal kingdom classification. Environmental determinants of parasitic diseases. Immunological factors in the host-parasite system. Biochemical aspects of host-parasite interactions with particular significance in medicine. The most common human parasitic infections (native and imported). Biology and pathogenicity of selected species of parasitic protozoa. Laboratory diagnostics of selected parasitoses (molecular methods of parasite detection, microscopic examination, and serological diagnostics). |                                                                                                                                                                                                          |                               |
|                                                          | Course content – laboratory<br><br>Identification of molds and yeasts. Molecular identification of molds and yeasts. Analysis of gene expression levels in selected fungal species responsible for resistance to azole drugs. Microscopic examination of prepared slides of various parasite species. DNA isolation from canine blood and molecular detection of <i>Babesia canis</i> DNA using PCR. DNA isolation from mouse tissues (liver, heart, brain, kidneys, spleen) and molecular detection of <i>Toxoplasma gondii</i> tissue cysts in intermediate host tissues.                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                          |                               |
| Prerequisites and co-requisites                          | Knowledge and skills in the field of molecular biology.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                          |                               |
| Assessment methods and criteria                          | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Passing threshold                                                                                                                                                                                        | Percentage of the final grade |
|                                                          | written exam on mycology lectures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 60.0%                                                                                                                                                                                                    | 25.0%                         |
|                                                          | written exam on parasitology lectures                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 60.0%                                                                                                                                                                                                    | 25.0%                         |
|                                                          | Laboratory report – mycology part                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 60.0%                                                                                                                                                                                                    | 12.0%                         |
|                                                          | Assessment tests – mycology section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 60.0%                                                                                                                                                                                                    | 13.0%                         |
|                                                          | Laboratory report – parasitology part                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 60.0%                                                                                                                                                                                                    | 12.0%                         |
|                                                          | Assessment tests – parasitology section                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 60.0%                                                                                                                                                                                                    | 13.0%                         |
| Recommended reading                                      | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1. Scientific publications related to the lecture topics<br>2. Atlas of Human Pathogenic Fungi – Paweł Krzyściak, Medpharm Publishing<br>3. Atlas of Human Parasites – Alicja Buczek, Koliber Publishing |                               |
|                                                          | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -                                                                                                                                                                                                        |                               |
|                                                          | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                          |                               |
| Example issues/ example questions/ tasks being completed | <ul style="list-style-type: none"><li>• The impact of molecular taxonomy on modern mycology.</li><li>• Mechanisms of fungal resistance to antimycotic drugs.</li><li>• Molecular diagnostic strategies in parasitology.</li><li>• Biochemical and molecular host-parasite interactions.</li><li>• Imported diseases and environmental determinants</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                          |                               |
| Practical activities within the subject                  | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                          |                               |

Document generated electronically. Does not require a seal or signature.