

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                |                                                          |                                           |                                     |                                                                                                                      |            |     |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Diversity of cryptogamic plants, PG_00154382                                                                                                                                                                                                                                                                   |                                                          |                                           |                                     |                                                                                                                      |            |     |
| Field of study                              | Różnorodność roślin zarodnikowych - ćwiczenia laboratoryjne (Ćw. laboratoryjne)                                                                                                                                                                                                                                |                                                          |                                           |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                                                                                                                                                   |                                                          | Academic year of realisation of subject   |                                     | 2025/2026                                                                                                            |            |     |
| Education level                             | Bachelor's studies                                                                                                                                                                                                                                                                                             |                                                          | Subject group                             |                                     | Obligatory subject group in the field of study<br>Subject group related to scientific research in the field of study |            |     |
| Mode of study                               | full-time studies                                                                                                                                                                                                                                                                                              |                                                          | Mode of delivery                          |                                     | at the university                                                                                                    |            |     |
| Year of study                               | 1                                                                                                                                                                                                                                                                                                              |                                                          | Language of instruction                   |                                     | Polish                                                                                                               |            |     |
| Semester of study                           | 1                                                                                                                                                                                                                                                                                                              |                                                          | ECTS credits                              |                                     | 2.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                       |                                                          | Assessment form                           |                                     | credit                                                                                                               |            |     |
| Conducting unit                             | Department of Plant Ecology -> Faculty of Biology -> Rector                                                                                                                                                                                                                                                    |                                                          |                                           |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                             |                                                          | dr hab. Joanna Świąta-Musznicka           |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                       |                                                          | dr Eugeniusz Pronin<br>mgr Rafał Ronowski |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                    | Lecture                                                  | Tutorial                                  | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                          | 0.0                                                      | 0.0                                       | 30.0                                | 0.0                                                                                                                  | 0.0        | 30  |
|                                             | 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                                                                                                                                                                                                                                                                                          | 30                                                       |                                           | 6.0                                 |                                                                                                                      | 14.0       | 50  |
| Subject objectives                          | Learning about the diversity of cryptogamic plants. Learning about the functions of cryptogamic plants in ecosystems and the human economy. To review selected representatives of the different systematic groups of cryptogamic plants. Learning to identify algae, mosses, liverworts, horsetails and ferns. |                                                          |                                           |                                     |                                                                                                                      |            |     |

| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Subject outcome                                                                                                                                                                                                                                                                                          | Method of verification                                                                                                                                                         |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | [BIOLL3_W06] The graduate will know the characteristics, systematics and understand the evolution of selected groups of organisms including molecular basis and basic concepts and mechanisms of evolution                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | is able to characterise the main systematic groups of algae, bryophytes and ferns; is familiar with the latest systematic approaches and theories of evolution of cryptogamic plants, taking into account the results of molecular studies, and describes the basic concepts and mechanisms of evolution | [SW4] test/egzamin - ustny lub pisemny<br>[SW1] wypowiedź ustna/rozmowa/dyskusja<br>[SW2] prezentacja/projekt/referat/raport<br>[SW5] realizacja zadania problemowego          |
|                                 | [BIOLL3_W01] The graduate identify the constituent elements and explain the differences in the structure and function of prokaryotic and eukaryotic cells                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | can describe the basic structural elements and explain the differences in structure and function of a prokaryotic and eukaryotic cell using the example of photoautotrophic organisms                                                                                                                    | [SW4] test/egzamin - ustny lub pisemny<br>[SW1] wypowiedź ustna/rozmowa/dyskusja<br>[SW2] prezentacja/projekt/referat/raport                                                   |
|                                 | [BIOLL3_U02] The graduate will be able to make observations individually and in teams, and carry out basic physical, biological and chemical measurements in the field or laboratory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | makes observations of microscopic and macroscopic material and performs basic descriptions and measurements of organisms in the laboratory                                                                                                                                                               | [SU1] wypowiedź ustna/rozmowa/dyskusja<br>[SU2] prezentacja/projekt/referat/raport<br>[SU3] opracowanie tekstowe/praca pisemna<br>[SU6] demonstracja umiejętności praktycznych |
|                                 | [BIOLL3_U01] The graduate will be able to use basic apparatus and research tools for the collection, preparation and identification of cryptogamic plants and follows the correct sequence of operations in laboratory and field work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | uses basic equipment and research tools for the collection, preparation and identification of cryptogamic plants and follows the correct sequence of operations in laboratory and field work                                                                                                             | [SU2] prezentacja/projekt/referat/raport<br>[SU3] opracowanie tekstowe/praca pisemna<br>[SU5] realizacja zadania problemowego                                                  |
|                                 | [BIOLL3_K06] The graduate is prepared to take responsibility for the equipment/materials entrusted to them and for their own work and that of others                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | is responsible for the equipment/materials provided and for his/her own work, and respects the work of others                                                                                                                                                                                            | [SK8] obserwacja samodzielnej lub zespołowej pracy studenta                                                                                                                    |
| Subject contents                | <p>Methods of collecting and identifying cryptogamic plants for scientific and teaching purposes. Effects of habitat conditions and interspecific competition on the occurrence of plants. Cryptogamic plants in modern aquatic, marsh and terrestrial ecosystems. Identifying habitats of occurrence, identification of algae, bryophytes and ferns, collection of herbarium material, bioindicative value of plants. Basics of classification of cryptogamic plants in evolutionary terms. Characterisation of morphological and anatomical diversity of cryptogamic plants based on selected organisms. The use of cryptogamic plants in industry and medicine. Protection of cryptogamic plants in Poland. Field classes are organised at the beginning of the semester in the form of block classes (3 field trips of 5 lesson hours each) in Gdańsk and Sopot Kamienny Potok.</p> |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                |
| Prerequisites and co-requisites |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Passing threshold                                                                                                                                                                                                                                                                                        | Percentage of the final grade                                                                                                                                                  |
|                                 | attendance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 85.0%                                                                                                                                                                                                                                                                                                    | 0.0%                                                                                                                                                                           |
|                                 | colloquium V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |
|                                 | colloquium VI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |
|                                 | colloquium IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |
|                                 | colloquium III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |
|                                 | colloquium II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |
|                                 | colloquium I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |
|                                 | exercise report                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |
|                                 | presentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 51.0%                                                                                                                                                                                                                                                                                                    | 7.7%                                                                                                                                                                           |
|                                 | worksheets                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 51.0%                                                                                                                                                                                                                                                                                                    | 7.7%                                                                                                                                                                           |
|                                 | practical pass IV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 51.0%                                                                                                                                                                                                                                                                                                    | 7.7%                                                                                                                                                                           |
|                                 | practical pass III                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |
|                                 | practical pass II                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |
|                                 | practical pass I                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 51.0%                                                                                                                                                                                                                                                                                                    | 7.69%                                                                                                                                                                          |

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|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                          | <p>Szweykowska A., Szweykowski J. 2020. Botanika, Systematyka T. 2. PWN, Warszawa.</p> <p>Wójciak H. 2007. Porosty, mszaki, paprotniki. Flora Polski. Multico, Warszawa.</p> <p>Podbielkowski Z., Rejment-Grochowska I., Skirgiełło A. 1979. Rośliny zarodnikowe. PWN, Warszawa.</p> <p>Ruggiero M. A, Cavalier-Smith T. i in. 2015. A higher level classification of all living organisms. PlosOne 10(4): e0119248.</p> <p>Kadłubowska J. 1976. Zarys algologii. PWN, Warszawa. Szweykowska A., Szweykowski J. 2017. Botanika, Systematyka T. 2. PWN, Warszawa.</p>          |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                  | <p>Kaźmierczakowa R. (red.). 2016. Polska czerwona lista paprotników i roślin kwiatowych. Instytut Ochrony Przyrody PAN, Kraków.</p> <p>Kremer B.P., Muhle H. 1998. Porosty, mchy, paprotniki. Leksykon przyrodniczy. Świat Książki, Warszawa.</p> <p>Szafran B. 1957. Mchy. T. 1, 2. Flora Polska. Rośliny zarodnikowe Polski i ziem ościennych. PWN, Warszawa.</p> <p>Vanderpoorten A., Goffinet B. 2010. Introduction to Bryophytes. Cambridge University Press.</p> <p>Mehlreter K., Walker L. R., Sharpe J. M. 2010. Fern Ecology. Cambridge Univ. Press, Cambridge.</p> |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Example issues/<br>example questions/<br>tasks being completed | <p>Characteristics of the main groups of photoautotrophic organisms according to the Cavalier-Smith system. Basis of classification in evolutionary terms. Morphological forms of organisms. Overview of aquatic photoautotrophs (e.g. Cyanobacteria, Bacillariophyceae, Phaeophyceae). Review of terrestrial forms with a dominant sporophyte (e.g. Tracheophyta: Lycopodiophytina).</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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