

## Subject card

|                                             |                                                                                                                                                                                            |                                                          |                                                                                                                                                                                                                    |                                     |                                                                                                                      |            |     |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Basics of ecotoxicology, PG_00142789                                                                                                                                                       |                                                          |                                                                                                                                                                                                                    |                                     |                                                                                                                      |            |     |
| Field of study                              | Natural Resources Conservation                                                                                                                                                             |                                                          |                                                                                                                                                                                                                    |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                               |                                                          | Academic year of realisation of subject                                                                                                                                                                            |                                     | 2026/2027                                                                                                            |            |     |
| 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                               | 2                                                                                                                                                                                          |                                                          | Language of instruction                                                                                                                                                                                            |                                     | Polish                                                                                                               |            |     |
| Semester of study                           | 3                                                                                                                                                                                          |                                                          | ECTS credits                                                                                                                                                                                                       |                                     | 1.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                                                                                                   |                                                          | Assessment form                                                                                                                                                                                                    |                                     | credit                                                                                                               |            |     |
| Conducting unit                             | Laboratory of Biosystematics and Ecology of Aquatic Invertebrates -> Department of Evolutionary Genetics and Biosystematics -> Faculty of Biology -> Rector                                |                                                          |                                                                                                                                                                                                                    |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                         |                                                          | dr hab. Anna Iglikowska                                                                                                                                                                                            |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                                                                   |                                                          |                                                                                                                                                                                                                    |                                     |                                                                                                                      |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                | Lecture                                                  | Tutorial                                                                                                                                                                                                           | Laboratory                          | Project                                                                                                              | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                      | 15.0                                                     | 0.0                                                                                                                                                                                                                | 0.0                                 | 0.0                                                                                                                  | 0.0        | 15  |
|                                             | E-learning hours included: 0.0                                                                                                                                                             |                                                          |                                                                                                                                                                                                                    |                                     |                                                                                                                      |            |     |
| Learning activity and number of study hours | Learning activity                                                                                                                                                                          | Participation in didactic classes included in study plan |                                                                                                                                                                                                                    | Participation in consultation hours |                                                                                                                      | Self-study | SUM |
|                                             | Number of study hours                                                                                                                                                                      | 15                                                       |                                                                                                                                                                                                                    | 3.0                                 |                                                                                                                      | 7.0        | 25  |
| Subject objectives                          | Familiarizing students with the ecological consequences of toxic substances                                                                                                                |                                                          |                                                                                                                                                                                                                    |                                     |                                                                                                                      |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                             |                                                          | Subject outcome                                                                                                                                                                                                    |                                     | Method of verification                                                                                               |            |     |
|                                             | [OZPL3_W07] The graduate has an advanced understanding of the methods and means of nature and environmental protection, including nature monitoring                                        |                                                          | - the student learns about modern research methods used in ecotoxicology, understanding the dependencies of the impact of various toxic substances on phenomena and processes occurring in the environment (O_W07) |                                     | [SW4] test/exam - oral or written<br>[SW1] oral statement/ conversation/discussion                                   |            |     |
|                                             | [OZPL3_K08] The graduate is ready to systematically update his/ her natural knowledge and to apply it in practice                                                                          |                                                          | - the student demonstrates the need for systematic updating of knowledge on ecotoxicological issues (O_K08)                                                                                                        |                                     | [SK1] oral statement/conversation/ discussion<br>[SK8] observation of student's independent or team work             |            |     |
|                                             | [OZPL3_U03] The graduate is able to search for and use available sources of biological information, including electronic sources, and critically analyse them                              |                                                          | - the student independently searches for and uses available sources of information on ecotoxicology, including electronic sources (O_U03)                                                                          |                                     | [SU1] oral statement/conversation/ discussion<br>[SU8] observation of student's independent or team work             |            |     |
|                                             | [OZPL3_W13] The graduate has an advanced understanding of the fundamental rules, methods, and techniques of environmental research and their potential applications in nature conservation |                                                          | - the student presents the possibilities of using ecotoxicological techniques, research methods and standards in the protection of nature and the environment (O_W13)                                              |                                     | [SW4] test/exam - oral or written<br>[SW1] oral statement/ conversation/discussion                                   |            |     |

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| Subject contents                | Objectives of ecotoxicological research, definitions and outline of the history of ecotoxicology. Division of toxic substances in terms of their impact on the biotic environment. Types and effects of toxic substances on organisms, populations and ecosystems. Influence of environmental factors on the effectiveness of toxic substances. Methods of ecotoxicological research. Selected standards and guidelines for assessing the ecotoxicity of chemical substances. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |
| Prerequisites and co-requisites | basic knowledge of general ecology                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Percentage of the final grade |
|                                 | Final test                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 100.0%                        |
| Recommended reading             | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p>A.1. used during lectures Walker C.H., Hopkin S.P., Sibly R.M., Peakal B. 2002. Podstawy ekotoksykologii. PWN, Warszawa. A.2. studied independently by the student Walker C.H., Hopkin S.P., Sibly R.M., Peakal B. 2002. Podstawy ekotoksykologii. PWN, Warszawa.</p> <p>articles dealing with ecotoxicology (e.g., from internet sources)</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                               |
|                                 | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p>Bieszke B., Namiotko L., Namiotko T. 2020. Life history traits of a temporary water ostracod <i>Heterocypris incongruens</i> (Crustacea, Ostracoda) are affected by power frequency (50 Hz) electromagnetic environmental pollution. <i>The European Zoological Journal</i>, 87 (1): 148155.</p> <p>Iglikowska A., Humphreys-Williams E., Przytarska J., Chelchowski M., Kukliński P. 2020. Minor and trace elements in skeletons of Arctic echinoderms. <i>Marine Pollution Bulletin</i>, 158 (111377).</p> <p>Laskowski R., Migula P. 2004. Ekotoksykologia od komórki do ekosystemu. PWRiL, Warszawa. Szara-Bąk M., Baran A. Klimkowicz-Pawlas A., Tkaczewska J., Wojtasik B. 2021. Mobility, ecotoxicity, bioaccumulation and sources of trace elements in the bottom sediments of the Rożnów reservoir. <i>Environmental Geochemistry and Health</i>, 43(4): 1-18.</p> |                               |
|                                 | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |

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| Example issues/<br>example questions/<br>tasks being completed | <p>1. Please explain the abbreviations:</p> <p>a) TZO</p> <p>b) OZE</p> <p>c) LD 50</p> <p>2. Briefly describe the ways heavy metals spread in the environment.</p> <p>3. Persistent organic pollutants:</p> <p>a) do not accumulate in organisms, they decompose in them,</p> <p>b) are excreted from the bodies of organisms,</p> <p>c) are not excreted from the bodies of organisms and do not decompose in them,</p> <p>d) are secreted by organisms,</p> <p>e) accumulate to a small extent, they decompose in organisms.</p> |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

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