

## Subject card

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| Subject name and code                       | Marine trophic networks, PG_00144125                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                          |                                         |                                     |                        |            |     |
| Field of study                              | Natural Resources Conservation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          |                                         |                                     |                        |            |     |
| Date of commencement of studies             | October 2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          | Academic year of realisation of subject |                                     | 2026/2027              |            |     |
| Education level                             | Bachelor's studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                          | Subject group                           |                                     | Optional subject group |            |     |
| Mode of study                               | full-time studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | Mode of delivery                        |                                     | at the university      |            |     |
| Year of study                               | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | Language of instruction                 |                                     | Polish<br>Polish       |            |     |
| Semester of study                           | 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                          | ECTS credits                            |                                     | 1.0                    |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | Assessment form                         |                                     | credit                 |            |     |
| Conducting unit                             | Laboratory of Vertebrate Ecology and Ethology -> Department of Vertebrate Ecology and Zoology -> Faculty of Biology -> Rector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                          |                                         |                                     |                        |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                          | dr Katarzyna Zmudczyńska-Skarbek        |                                     |                        |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                                         |                                     |                        |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Lecture                                                  | Tutorial                                | Laboratory                          | Project                | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 0.0                                                      | 15.0                                    | 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                                                       |                                         | 2.0                                 |                        | 8.0        | 25  |
| Subject objectives                          | 1. To provide a basic understanding of the biogeography and biodiversity of the Earths marine ecosystems.<br>2. To understand the trophic and functional relationships between organisms in different types of seas and habitats.<br>3. To understand how entire food webs respond to individual changes in abiotic conditions or in the relationships between organisms.<br>4. To highlight the role of living organisms in the transfer of matter between horizontal and vertical zones in the sea and between the sea and land.<br>5. To familiarise students with techniques for sampling and analysing marine biological materials.<br>Translated with DeepL.com (free version) |                                                          |                                         |                                     |                        |            |     |

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| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Subject outcome                                                                                                                                              | Method of verification                                  |
|                                 | [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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | presents the basic principles, methods and techniques of marine environmental research and their potential applications in marine conservation               | [SW4] test/exam - oral or written                       |
|                                 | [OZPL3_U02] The graduate can read with comprehension scientific texts in the field of natural sciences in Polish and simple texts in English                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | can read and understand academic texts on marine biology in Polish and simple texts in English                                                               | [SU1] oral statement/conversation/discussion            |
|                                 | [OZPL3_U03] The graduate is able to search for and use available sources of biological information, including electronic sources, and critically analyse them                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | independently searches for and comprehends scientific texts on marine biology in Polish and simple texts in English                                          | [SU1] oral statement/conversation/discussion            |
|                                 | [OZPL3_W05] The graduate understands the fundamental principles and mechanisms of life at the population, biocenosis, and ecosystem levels, as well as the temporal and spatial factors that influence biodiversity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | explains the basic principles and describes the mechanisms underlying marine food webs, as well as the temporal and spatial factors influencing biodiversity | [SW4] test/exam - oral or written                       |
|                                 | [OZPL3_U07] The graduate is able to draw correct conclusions on the basis of analysis and synthesis of data from various sources                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | draws valid conclusions based on the analysis and synthesis of biological data from various sources, including scientific articles                           | [SU1] oral statement/conversation/discussion            |
|                                 | [OZPL3_K01] The graduate is ready to recognise the limitations in his/her own knowledge and understands the need for continuous learning and development                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | is aware of their current level of knowledge, understands the need for continuous learning and development, and is open to new ideas                         | [SK8] observation of student's independent or team work |
| Subject contents                | <ol style="list-style-type: none"><li>1. The biogeography and biodiversity of the Earths marine ecosystems, including biodiversity hotspots.</li><li>2. The structure and functioning of marine food webs, and keystone species in various types of seas and habitats (including plankton, kelp forests, seagrass beds, coral reefs, soft and hard bottom communities, sea ice algae and fauna, and deep-sea and seamount communities).</li><li>3. Trophic cascades and mechanisms regulating the trophic pyramid (top-down, bottom-up, wasp-waist).</li><li>4. The role of living organisms in the transfer of matter within and between horizontal and vertical zones in the sea (food chain, detritus chain, microbial loop) and between the sea and land (including the role of seabirds).</li><li>5. Ecosystem engineers in the marine environment.</li><li>6. The consequences of climate change for marine organisms.</li><li>7. Techniques for sampling and analysing marine biological materials.</li></ol> |                                                                                                                                                              |                                                         |
| Prerequisites and co-requisites | A basic understanding of ecology, particularly marine ecology. A sufficient command of English to enable the use of specialist literature.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                              |                                                         |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Passing threshold                                                                                                                                            | Percentage of the final grade                           |
|                                 | multiple-choice test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 51.0%                                                                                                                                                        | 100.0%                                                  |
| Recommended reading             | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Nybakken JW, Bartness MD (eds). 2005. Marine Biology, an ecological approach, Person Benjamin Cummings                                                       |                                                         |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Weiner J. 2004. Życie i ewolucja biosfery. Wydawnictwo Naukowe PWN, Warszawa                                                                                 |                                                         |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sakshaug E, Johnsen G, Kovacs K (eds). 2009. Ecosystem Barents Sea. Tapir Academic Press, Trondheim                                                          |                                                         |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Mulder CPH, Anderson WB, Towns DR, Bellingham PJ (eds). 2011. Seabird Islands. Ecology, Invasion and Restoration. Oxford University Press, New York          |                                                         |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Selected scientific articles from the relevant literature, recommended by the lecturer                                                                       |                                                         |

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|                                                                | Supplementary literature | Zmudczyńska-Skarbek K, Balazy P. 2017. Following the flow of ornithogenic nutrients through the Arctic marine coastal food webs. <i>Journal of Marine Systems</i> 168: 3137<br><br>Mladenov PV. 2013. Marine Biology. A very short introduction. Oxford University Press, New York |
|                                                                | eResources addresses     |                                                                                                                                                                                                                                                                                    |
| Example issues/<br>example questions/<br>tasks being completed | none                     |                                                                                                                                                                                                                                                                                    |
| Work placement                                                 | Not applicable           |                                                                                                                                                                                                                                                                                    |

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