

## Subject card

|                                             |                                                                                                                                                                                                                                     |                                                          |                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                                                                                                                                     |            |     |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Basic techniques of isolation and cultivation of algae - laboratory exercises, PG_00075919                                                                                                                                          |                                                          |                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                                                                                                                                     |            |     |
| Field of study                              | Aquaculture – Business And Technology                                                                                                                                                                                               |                                                          |                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                                                                                                                                     |            |     |
| Date of commencement of studies             | October 2025                                                                                                                                                                                                                        |                                                          | Academic year of realisation of subject                                                                                                                                                                                                                                                                                                                                               |                                     | 2026/2027                                                                                                                           |            |     |
| Education level                             | Bachelor's studies                                                                                                                                                                                                                  |                                                          | Subject group                                                                                                                                                                                                                                                                                                                                                                         |                                     |                                                                                                                                     |            |     |
| Mode of study                               | full-time studies                                                                                                                                                                                                                   |                                                          | Mode of delivery                                                                                                                                                                                                                                                                                                                                                                      |                                     | at the university                                                                                                                   |            |     |
| Year of study                               | 2                                                                                                                                                                                                                                   |                                                          | Language of instruction                                                                                                                                                                                                                                                                                                                                                               |                                     | Polish                                                                                                                              |            |     |
| Semester of study                           | 4                                                                                                                                                                                                                                   |                                                          | ECTS credits                                                                                                                                                                                                                                                                                                                                                                          |                                     | 2.0                                                                                                                                 |            |     |
| Learning profile                            | practical                                                                                                                                                                                                                           |                                                          | Assessment form                                                                                                                                                                                                                                                                                                                                                                       |                                     | credit                                                                                                                              |            |     |
| Conducting unit                             | Department of Marine Ecosystems Functioning -> Faculty of Oceanography and Geography -> Rector                                                                                                                                      |                                                          |                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                                                                                                                                     |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                  |                                                          | dr Filip Pniewski                                                                                                                                                                                                                                                                                                                                                                     |                                     |                                                                                                                                     |            |     |
|                                             | Teachers                                                                                                                                                                                                                            |                                                          |                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                                                                                                                                     |            |     |
| 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                                                       |                                                                                                                                                                                                                                                                                                                                                                                       | 10.0                                |                                                                                                                                     | 20.0       | 60  |
| Subject objectives                          | The aim of the course is to familiarise students with the practical aspects of isolation techniques and maintenance of algal and cyanobacterial cultures.                                                                           |                                                          |                                                                                                                                                                                                                                                                                                                                                                                       |                                     |                                                                                                                                     |            |     |
| Learning outcomes                           | Course outcome                                                                                                                                                                                                                      |                                                          | Subject outcome                                                                                                                                                                                                                                                                                                                                                                       |                                     | Method of verification                                                                                                              |            |     |
|                                             | [AKWAL3-K05] student is ready to appreciate the practical application of acquired knowledge                                                                                                                                         |                                                          | Student is ready to critically evaluate the practical application of the knowledge gained on the isolation, culturing of cyanobacterial and algal strains, and possibilities of biomass processing (topics covered in practical classes)                                                                                                                                              |                                     | [SK8] observation of student's independent or team work                                                                             |            |     |
|                                             | [AKWAL3-U02] can make observations and perform simple physical / biological / chemical measurements that are typical in socio-economic activity based on natural sciences                                                           |                                                          | Student is able to carry out laboratory experiments using cultures of cyanobacteria and algae in order to characterise them and identify possible economic applications topics covered in practical classes)                                                                                                                                                                          |                                     | [SU3] text preparation/written work<br>[SU4] test/exam - oral or written<br>[SU8] observation of student's independent or team work |            |     |
|                                             | [AKWAL3_W06] knows and discusses techniques, research methods and tools used in aquaculture                                                                                                                                         |                                                          | Student knows and discusses techniques and research tools used in the isolation and culturing of cyanobacteria and algae (topics covered in practical classes)                                                                                                                                                                                                                        |                                     | [SW2] presentation/project/paper/report                                                                                             |            |     |
|                                             | [AKWAL3-K01] is ready to assess the risks and threats stemming from working in the laboratory and is responsible for the equipment and teaching materials entrusted to them and for the safety of their own work and that of others |                                                          | Student is prepared to assess the risks and hazards of working in the algology laboratory and to assess the consequences of mistakes made in the cultivation of cyanobacteria and algae in culture collections; is responsible for the equipment and didactic materials entrusted to him and for the safety of his own work and that of others (topics covered in practical classes). |                                     | [SK8] observation of student's independent or team work                                                                             |            |     |

|                                                                |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Subject contents                                               | 1. Isolation of strains of algae and cyanobacteria from natural assemblages of phytoplankton and microphytobenthos assemblages.<br>2. Establishing cultures of cyanobacteria and algae and monitoring their growth.<br>3. Selecting appropriate media and growth conditions depending on the purpose of the cultures. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |
| Prerequisites and co-requisites                                | none                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                              | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Percentage of the final grade |
|                                                                | test                                                                                                                                                                                                                                                                                                                  | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 60.0%                         |
|                                                                | raport                                                                                                                                                                                                                                                                                                                | 51.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 25.0%                         |
|                                                                | observation of independent student work                                                                                                                                                                                                                                                                               | 100.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 15.0%                         |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                      | 1. Richmond, A., 2004, Handbook of microalgal culture. Biotechnology and applied phycology. Blackwell Publishing, Oxford, UK.<br>2. Anderson R.A., 2005, Algal culturing techniques. Elsevier Academic Press, Oxford, UK.                                                                                                                                                                                                                                                                                                      |                               |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                              | 1. Richmond, A., 2000, Handbook of microalgal mass culture. CRC Press, Baco Raton, Florida.<br>2. Khanal, S.K., Surampalli, R.Y., Zhang, T.C., Lamsal, B.P., Tyagi, R.D., Kao, C.M., 2010, Bioenergy and biofuel from biowaste and biomass. ASCE, Reston, Virginia.<br>3. Johansen, M.N., 2012, Microalgae. Biotechnology, microbiology and energy. NOVA Science Publisher INC., New York.<br>4. Fogg, G.E., Thake, B., 1987, Algal Cultures and Phytoplankton Ecology. The University of Wisconsin Press, Madison, Wisconsin. |                               |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |
|                                                                |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |
| Example issues/<br>example questions/<br>tasks being completed |                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                               |

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