



## Subject card

|                                             |                                                                                                                                  |                                                          |                                                                                                                                                                                                                          |                                     |                                                                                                                                                                     |            |     |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Tissue Cultures, PG_00054769                                                                                                     |                                                          |                                                                                                                                                                                                                          |                                     |                                                                                                                                                                     |            |     |
| Field of study                              | Biotechnology                                                                                                                    |                                                          |                                                                                                                                                                                                                          |                                     |                                                                                                                                                                     |            |     |
| Date of commencement of studies             | October 2024                                                                                                                     |                                                          | Academic year of realisation of subject                                                                                                                                                                                  |                                     | 2026/2027                                                                                                                                                           |            |     |
| Education level                             | first-cycle studies                                                                                                              |                                                          | Subject group                                                                                                                                                                                                            |                                     | Optional subject group<br>Subject group related to scientific research in the field of study                                                                        |            |     |
| Mode of study                               | Full-time studies                                                                                                                |                                                          | Mode of delivery                                                                                                                                                                                                         |                                     | at the university                                                                                                                                                   |            |     |
| Year of study                               | 3                                                                                                                                |                                                          | Language of instruction                                                                                                                                                                                                  |                                     | Polish                                                                                                                                                              |            |     |
| Semester of study                           | 6                                                                                                                                |                                                          | ECTS credits                                                                                                                                                                                                             |                                     | 3.0                                                                                                                                                                 |            |     |
| Learning profile                            | general academic profile                                                                                                         |                                                          | Assessment form                                                                                                                                                                                                          |                                     | assessment                                                                                                                                                          |            |     |
| Conducting unit                             | Department of Pharmaceutical Technology and Biochemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology |                                                          |                                                                                                                                                                                                                          |                                     |                                                                                                                                                                     |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                               |                                                          | dr hab. Ewa Augustin                                                                                                                                                                                                     |                                     |                                                                                                                                                                     |            |     |
|                                             | Teachers                                                                                                                         |                                                          |                                                                                                                                                                                                                          |                                     |                                                                                                                                                                     |            |     |
| Lesson types                                | Lesson type                                                                                                                      | Lecture                                                  | Tutorial                                                                                                                                                                                                                 | Laboratory                          | Project                                                                                                                                                             | Seminar    | SUM |
|                                             | Number of study hours                                                                                                            | 15.0                                                     | 0.0                                                                                                                                                                                                                      | 30.0                                | 0.0                                                                                                                                                                 | 0.0        | 45  |
|                                             | 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                                                                                                            | 45                                                       |                                                                                                                                                                                                                          | 3.0                                 |                                                                                                                                                                     | 27.0       | 75  |
| Subject objectives                          | The aim of the course is to familiarize students with the basic aspects of in vitro culture of plant and animal cells.           |                                                          |                                                                                                                                                                                                                          |                                     |                                                                                                                                                                     |            |     |
| Learning outcomes                           | Course outcome                                                                                                                   |                                                          | Subject outcome                                                                                                                                                                                                          |                                     | Method of verification                                                                                                                                              |            |     |
|                                             | K6_W08                                                                                                                           |                                                          | The student understands the basic aspects of in vitro cultivation of plant and animal cells.                                                                                                                             |                                     | [SW3] Assessment of knowledge contained in written work and projects<br>[SW1] Assessment of factual knowledge                                                       |            |     |
|                                             | K6_W06                                                                                                                           |                                                          | The student knows the structure of plant and animal eukaryotic cells, the basic mechanisms of cell signaling pathways and has the knowledge about nucleic acids.                                                         |                                     | [SW1] Assessment of factual knowledge<br>[SW3] Assessment of knowledge contained in written work and projects                                                       |            |     |
|                                             | K6_U06                                                                                                                           |                                                          | The student is able to set up plant and animal culutre in vitro. The student is able to subculture cells, conduct nucleic acid electrophoresis, and determine the biological activity of biologically active substances. |                                     | [SU4] Assessment of ability to use methods and tools<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[SU1] Assessment of task fulfilment |            |     |

|                                         |                                                                  |                                                                                                                                                                                                                                                                                                                              |                               |
|-----------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| Subject contents                        | Course content – lecture<br>Types of in vitro cultures.          |                                                                                                                                                                                                                                                                                                                              |                               |
|                                         | Secondary metabolites.                                           |                                                                                                                                                                                                                                                                                                                              |                               |
|                                         | Establishing in vitro plant and animal breeding.                 |                                                                                                                                                                                                                                                                                                                              |                               |
|                                         | Stem cells and their use.                                        |                                                                                                                                                                                                                                                                                                                              |                               |
|                                         | Determination of biological activity of chemotherapeutic agents. |                                                                                                                                                                                                                                                                                                                              |                               |
|                                         | Plant and animal tissues.                                        |                                                                                                                                                                                                                                                                                                                              |                               |
|                                         | Isolation of DNA and chlorophyll from plant cells.               |                                                                                                                                                                                                                                                                                                                              |                               |
|                                         | Basic immunocytochemical techniques.                             |                                                                                                                                                                                                                                                                                                                              |                               |
| Prerequisites and co-requisites         | Knowledge of cell biology, biochemistry, general biotechnology.  |                                                                                                                                                                                                                                                                                                                              |                               |
| Assessment methods and criteria         | Subject passing criteria                                         | Passing threshold                                                                                                                                                                                                                                                                                                            | Percentage of the final grade |
|                                         | laboratory                                                       | 60.0%                                                                                                                                                                                                                                                                                                                        | 40.0%                         |
|                                         | lecture                                                          | 60.0%                                                                                                                                                                                                                                                                                                                        | 60.0%                         |
| Recommended reading                     | Basic literature                                                 | 1. S. Malepszy. Plant biotechnology. PWN 2001.<br><br>2. S. Stokłosowa. Cell and tissue culture. PWN 2004.<br><br>3. E. Augustin. Selected aspects of plant and animal cell culture. Group work. Gdańsk, 2010.                                                                                                               |                               |
|                                         | Supplementary literature                                         | 1. B. Alberts et al. Fundamentals of cell biology. Introduction to molecular biology. PWN 1999, 2005.<br><br>2. W. Sawicki. Histology. PZWL Medical Publishing House 2000.<br><br>3. R.I. Freshney. Culture of animal cells. 5th edition. Wiley-Liss, 2005.                                                                  |                               |
|                                         | eResources addresses                                             |                                                                                                                                                                                                                                                                                                                              |                               |
|                                         | Example issues/<br>example questions/<br>tasks being completed   | List the types of in vitro plant cultures.<br><br>Methods of obtaining plant secondary metabolites.<br><br>How to start an in vitro culture of animal cells?<br><br>Basic composition of in vitro plant and animal culture media.<br><br>List the methods of determining the biological activity of chemotherapeutic agents. |                               |
| Practical activities within the subject | Not applicable                                                   |                                                                                                                                                                                                                                                                                                                              |                               |