

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                     |                                                          |                                                   |                                     |                                                                                                                                                |            |     |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Plant secondary metabolites, PG_00154754                                                                                                                                                                                                                                                                                                                            |                                                          |                                                   |                                     |                                                                                                                                                |            |     |
| Field of study                              | Metabolity wtórne roślin (Ćw. audytoryjne)                                                                                                                                                                                                                                                                                                                          |                                                          |                                                   |                                     |                                                                                                                                                |            |     |
| Date of commencement of studies             | October 2024                                                                                                                                                                                                                                                                                                                                                        |                                                          | Academic year of realisation of subject           |                                     | 2025/2026                                                                                                                                      |            |     |
| Education level                             | Master's studies                                                                                                                                                                                                                                                                                                                                                    |                                                          | Subject group                                     |                                     | Obligatory subject group in the field of study<br>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                               | 2                                                                                                                                                                                                                                                                                                                                                                   |                                                          | Language of instruction                           |                                     | Polish                                                                                                                                         |            |     |
| Semester of study                           | 3                                                                                                                                                                                                                                                                                                                                                                   |                                                          | ECTS credits                                      |                                     | 1.0                                                                                                                                            |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                            |                                                          | Assessment form                                   |                                     | credit                                                                                                                                         |            |     |
| Conducting unit                             |                                                                                                                                                                                                                                                                                                                                                                     |                                                          |                                                   |                                     |                                                                                                                                                |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                  |                                                          | dr Darya Harshkova                                |                                     |                                                                                                                                                |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                            |                                                          | dr Darya Harshkova<br><br>dr hab. Wojciech Pokora |                                     |                                                                                                                                                |            |     |
| 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                                                                                                                                                                                                                                                                                                                                      |                                                          |                                                   |                                     |                                                                                                                                                |            |     |
|                                             | Additional information:                                                                                                                                                                                                                                                                                                                                             |                                                          |                                                   |                                     |                                                                                                                                                |            |     |
|                                             | wykład konwersatoryjny, część zajęć jest prowadzona poza siedzibą Uczelni                                                                                                                                                                                                                                                                                           |                                                          |                                                   |                                     |                                                                                                                                                |            |     |
| Learning activity and number of study hours | Learning activity                                                                                                                                                                                                                                                                                                                                                   | Participation in didactic classes included in study plan |                                                   | Participation in consultation hours |                                                                                                                                                | Self-study | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                               | 15                                                       |                                                   | 3.0                                 |                                                                                                                                                | 7.0        | 25  |
| Subject objectives                          | Familiarize students with the function of secondary metabolites in plant organisms and their role in the phenomenon of allelopathy; the possibilities of using the knowledge of the occurrence, structure and biological activity of plant secondary metabolites in everyday life, and the evaluation of the effects of plant secondary products on the human body. |                                                          |                                                   |                                     |                                                                                                                                                |            |     |

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|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|
| Learning outcomes                                        | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Subject outcome                                                                                                                                                                                                                                                                                     | Method of verification                    |
|                                                          | [BIOLMU2_W04] the graduate has an in-depth knowledge of the chosen specialisation in the biological sciences                                                                                                                                                                                                                                                                                                                                                                                                                           | The graduate has an in-depth knowledge of plant secondary metabolism                                                                                                                                                                                                                                | [SW2] prezentacja/projekt/referat/ raport |
|                                                          | [BIOLMU2_U07] the graduate is able to critically confront biological information from a variety of sources and, on this basis, draw valid conclusions                                                                                                                                                                                                                                                                                                                                                                                  | The graduate critically confronts information about secondary metabolites from various sources and on this basis draws reasonable conclusions                                                                                                                                                       | [SU2] prezentacja/projekt/referat/ raport |
|                                                          | [BIOLMU2_U10] the graduate is able to prepare oral presentations in Polish and foreign languages on specific subjects within the chosen specialisation                                                                                                                                                                                                                                                                                                                                                                                 | Graduate has the ability to give oral speeches in Polish on secondary products of plants and their use by humans                                                                                                                                                                                    | [SU1] wypowiedź ustna/rozmowa/ dyskusja   |
|                                                          | [BIOLMU2_K01] the graduate is ready to take initiative and act independently and feels the need for lifelong learning                                                                                                                                                                                                                                                                                                                                                                                                                  | The graduate shows initiative and self-reliance in acquiring scientific literature on plant secondary metabolites                                                                                                                                                                                   | [SK2] prezentacja/projekt/referat/ raport |
| Subject contents                                         | The most important products of plant secondary metabolism and their importance for the pharmaceutical and biotechnology industries. Getting to know the pathways biosynthesis of secondary metabolites, their biological activity and chemical and biotechnological methods of their production. The effects of selected of secondary metabolites of plants on animal/human organisms - mechanism of interaction - toxicity and detoxication. Basic methods Isolation, identification and purification of plant secondary metabolites. |                                                                                                                                                                                                                                                                                                     |                                           |
| Prerequisites and co-requisites                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                     |                                           |
| Assessment methods and criteria                          | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Passing threshold                                                                                                                                                                                                                                                                                   | Percentage of the final grade             |
|                                                          | active participation in discussions; observation of student work and attitudes                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 51.0%                                                                                                                                                                                                                                                                                               | 25.0%                                     |
|                                                          | report/ oral presentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 51.0%                                                                                                                                                                                                                                                                                               | 75.0%                                     |
| Recommended reading                                      | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Kołodziejczyk A., 2006. Naturalne związki organiczne. Wydawnictwo Naukowe PWN<br>Kopcewicz J., Lewak S., 2005 Fizjologia roślin. Wydawnictwo Naukowe PW                                                                                                                                             |                                           |
|                                                          | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Selected articles in scientific journals<br><br>Cseke L.J., Kirakosyan A., Kaufman P.B., Warber S.L., Duke J.A., Brielmann H. L., 2006. Natural Products from Plants. CRC Press, Taylor & Francis Group<br>Taiz L., Zeiger E. (red.). 2010. Plant Physiology. The Benjamin/Cummings Publ. Comp. Inc |                                           |
|                                                          | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                     |                                           |
|                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                     |                                           |
| Example issues/ example questions/ tasks being completed |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                     |                                           |
| Work placement                                           | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                     |                                           |

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