

## Subject card

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                         |                                     |                                                                          |            |     |
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| Subject name and code                       | Origin and evolution of life on Earth, PG_00132875                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          |                                         |                                     |                                                                          |            |     |
| Field of study                              | Historical game design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                          |                                         |                                     |                                                                          |            |     |
| Date of commencement of studies             | October 2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                          | Academic year of realisation of subject |                                     |                                                                          |            |     |
| Education level                             | Bachelor's studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | Subject group                           |                                     | Obligatory subject group in the field of study<br>Optional subject group |            |     |
| Mode of study                               | full-time studies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          | Mode of delivery                        |                                     | e-learning                                                               |            |     |
| Year of study                               | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          | Language of instruction                 |                                     | Polish<br>Polish language                                                |            |     |
| Semester of study                           | 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                          | ECTS credits                            |                                     | 2.0                                                                      |            |     |
| Learning profile                            | academic                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          | Assessment form                         |                                     | credit                                                                   |            |     |
| Conducting unit                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                         |                                     |                                                                          |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                          | dr hab. Piotr Mucha, prof. UG           |                                     |                                                                          |            |     |
|                                             | Teachers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                          | dr hab. Piotr Mucha, prof. UG           |                                     |                                                                          |            |     |
| Lesson types                                | Lesson type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Lecture                                                  | Tutorial                                | Laboratory                          | Project                                                                  | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 30.0                                                     | 0.0                                     | 0.0                                 | 0.0                                                                      | 0.0        | 30  |
|                                             | E-learning hours included: 30.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                          |                                         |                                     |                                                                          |            |     |
| 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                                                       |                                         | 0.0                                 |                                                                          | 20.0       | 50  |
| Subject objectives                          | to familiarize students with the theories of the origin of the Universe, the Milky Way, the Solar System and the Earth; to familiarize students with the origin and characteristics of matter; to acquaint students with non-biological (abiotic) methods of synthesizing organic compounds in nature; to acquaint students with the definitions and characteristics of the phenomenon of life; to acquaint students with the hypotheses of the origin of life on Earth; to acquaint students with the role of RNA in the origin of life on Earth; to familiarize students with the evolution of life on Earth |                                                          |                                         |                                     |                                                                          |            |     |

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| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Subject outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Method of verification            |
|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <p>Student:</p> <ul style="list-style-type: none"><li>-presents the basic principles of the "RNA world" defines the catalytic properties of RNA and their role in the flow of genetic information</li><li>-understands the need for continuous learning demonstrates the ability to critically evaluate and analyze information regarding the evolution the Universe and issues related to the origin of life as presented in the mass media</li><li>-presents the biochemical foundations of life</li><li>-presents the evolution of life on Earth</li><li>-is able to correlate environmental conditions with the possibility of life emerging</li><li>-describes methods for studying the structure and history of the Universe</li><li>-describes the pathways of chemical reactions during the prebiotic era</li></ul> | [SK4] test/exam - oral or written |
| Subject contents                | Stages of origin, evolution and structure of the Universe, Milky Way, Solar System and Earth, formation of chemical elements, abiotic synthesis of organic compounds, definitions and characteristics of the phenomenon of life, role of RNA in the origin of life, world of RNA, catalytic RNA (ribozymes), world of DNA and proteins, properties of the genetic code, structure of prokaryotic and eukaryotic cell, evolution of life on Earth, oldest traces of life |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                   |
| Prerequisites and co-requisites |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                   |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                | Passing threshold                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Percentage of the final grade     |
|                                 | single-choice test questions                                                                                                                                                                                                                                                                                                                                                                                                                                            | 50.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 100.0%                            |
| Recommended reading             | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                                        | R.F. Gesteland, "The RNA World," Cold Spring Harbor Laboratory Press, 2005, M. Yarus, "Life from an RNA World: The Ancestor Within," Harvard Univ. Press, 2011. S. Hawking A Brief History of Time, Zysk and S-ka Publishers, 2007Davies P. Cosmic Winning, Wyd. Prószyński i S-ka, 2008                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                   |
|                                 | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                | Clancy P., In Search of Life, Proszynski & S-ka Publishers, 2008                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                   |
|                                 | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                   |

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| Example issues/<br>example questions/<br>tasks being completed | Sample test question: The current age of the Universe is estimated to be about (billion years). a. 4-5.5 b. 8-10.5 c. 13.7-13.8 d. 19-20 |
| Work placement                                                 | Not applicable                                                                                                                           |

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