

## Subject card

|                                             |                                                                                                                                          |                                                          |                                         |                                     |                                                                                                                      |            |     |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------|------------|-----|
| Subject name and code                       | Genetics, PG_00154406                                                                                                                    |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Field of study                              | Biology                                                                                                                                  |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Date of commencement of studies             | October 2024                                                                                                                             |                                                          | Academic year of realisation of subject |                                     | 2025/2026                                                                                                            |            |     |
| Education level                             | undergraduate studies                                                                                                                    |                                                          | Subject group                           |                                     | Obligatory subject group in the field of study<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<br>polish                                                                                                     |            |     |
| Semester of study                           | 3                                                                                                                                        |                                                          | ECTS credits                            |                                     | 3.0                                                                                                                  |            |     |
| Learning profile                            | academic                                                                                                                                 |                                                          | Assessment form                         |                                     |                                                                                                                      |            |     |
| Conducting unit                             | Faculty of Biology                                                                                                                       |                                                          |                                         |                                     |                                                                                                                      |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                       |                                                          | dr hab. Anna Wysocka                    |                                     |                                                                                                                      |            |     |
|                                             | Teachers                                                                                                                                 |                                                          |                                         |                                     |                                                                                                                      |            |     |
| 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: 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                                                       |                                         | 4.0                                 |                                                                                                                      | 41.0       | 75  |
| Subject objectives                          | Familiarizing with the basic and current genetic issues                                                                                  |                                                          |                                         |                                     |                                                                                                                      |            |     |
|                                             | Broadening the knowledge/understanding of the laws of heredity and the genetic variation.                                                |                                                          |                                         |                                     |                                                                                                                      |            |     |
|                                             | Providing knowledge on the gene function/interaction, understanding the relationship: genotype-phenotype                                 |                                                          |                                         |                                     |                                                                                                                      |            |     |
|                                             | Developing the ability to analyse pedigrees and determine the probability of inheriting genes                                            |                                                          |                                         |                                     |                                                                                                                      |            |     |
|                                             | Familiarizing with methods of analysing the population genetic structure and factors disturbing the population balance                   |                                                          |                                         |                                     |                                                                                                                      |            |     |
|                                             | Presentation of research methods and development of the ability to ask questions, make assessments, solve uncomplicated genetic problems |                                                          |                                         |                                     |                                                                                                                      |            |     |

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| Learning outcomes               | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Subject outcome                                                                                                                                              | Method of verification                                  |
|                                 | [BIOLL3_W05] The graduate knows the rules and describe the mechanisms of life at the population, biocenosis and ecosystem levels and the temporal and spatial determinants of biodiversity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | explains the basic rules and describes the mechanisms of genetic diversity at the population level and the temporal and spatial determinants of biodiversity | [SW4] test/exam - oral or written                       |
|                                 | [BIOLL3_K04] The graduate is ready to take responsibility for their own work and to follow the rules of teamwork and responsibility for shared tasks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | is aware of the responsibility for their own work and readiness to comply with the rules of teamwork and take responsibility for jointly implemented tasks   | [SK8] observation of student's independent or team work |
|                                 | [BIOLL3_U05] The graduate will be able to synthesise data from a variety of sources and draw appropriate conclusions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | synthesizes information about modern research methods in genetics and draws adequate conclusions on this basis                                               | [SU1] oral statement/conversation/discussion            |
|                                 | [BIOLL3_W02] The graduate knows the structure and properties of biological macromolecules, the molecular mechanisms of basal metabolic pathways and genetic information flow and the sources of variation in organisms; the rules of inheritance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | knows and understands the mechanisms of genetic information flow and the sources of organisms variability, explains the rules of inheritance                 | [SW4] test/exam - oral or written                       |
|                                 | [BIOLL3_U03] The graduate, under the guidance of a mentor, is able to carry out simple tasks or research expertise typical of the biological sciences                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | awareness of responsibility for one's own work and readiness to comply with the rules of teamwork and take responsibility for jointly implemented tasks      | [SU1] oral statement/conversation/discussion            |
| Subject contents                | Mendelian inheritance with examples in plants, animals and humans. Inheritance inconsistent with Mendel's rules. Basic properties genes (e.g. gene penetrance, trait expressivity, pleiotropy, modification, genetic anticipation). Multiple alleles. Gene interaction allelic and non-allelic. Lethal genes. Sex-linked, sex-influenced, and sex-limited inheritance. Genetic lineage. Methods of genetic mapping. Inheritance of quantitative traits. Multifactorial inheritance. Behavioural genetics. Issues of mutagenesis. Epigenetics. Genetic basis of ontogeny of multicellular organisms. Structure of genomes. Extranuclear inheritance in Eucaryota. Genetic structure of the population. Genetic equilibrium. Factors influencing allele frequency in populations.                                                                                         |                                                                                                                                                              |                                                         |
| Prerequisites and co-requisites |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                              |                                                         |
| Assessment methods and criteria | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Passing threshold                                                                                                                                            | Percentage of the final grade                           |
|                                 | final test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 51.0%                                                                                                                                                        | 100.0%                                                  |
| Recommended reading             | <p>Basic literature</p> <p>Bal J. Molecular biology in medicine Elements of clinical genetics. PWN Warsaw, 2011. Boczkowski K. Outline of medical genetics. PZWL Warsaw, 1990. Brooker R. (ed.) Genetics: Analysis and Principles, 6-th edition. Mc Graw Hill. 2017. Charon K. M., Świtoński M. Animal genetics. PWN Warsaw, 2006. Charon K. M., Świtoński M. Genetics and genomics of animals. PWN Warsaw, 2019. Krebs J.E., Goldstein, E.S. Kilpatrick, S.T. Lewin's, GENES XII., Jones &amp; Bartlett Learning; 12th Edition. 2017. Oniszczenko W., Dragan W.Ł. Genetics of behavior in psychology and psychiatry. Wydawnictwo Naukowe SCHOLAR, Warsaw, 2008. Piątkowska B., Goc A., Dąbrowska G. A collection of tasks and questions in genetics, vol. I General genetics. NCU Publishing House, Toruń 1998. Węgleński P. Molecular genetics. PWN Warsaw, 2012.</p> |                                                                                                                                                              |                                                         |

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|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <p>Korf B. R. Human genetics. Solving medical problems. PWN Warsaw, 2003.</p> <p>Plomin R., Defries J.C., Mc Cleam G.E., McGuffin P. Genetics of behavior. PWN Warszawa, 2001</p> <p>Wysocka A., Lipowska M., Kilikowska A. 2010. Genetics in solving dyslexia puzzles: the overview. Acta Neuropsychologica, 8(4): 315-331</p> <p>Wysocka A., Lipowska M. 2010. Genetic basis of the co-occurrence of ADHD and developmental dyslexia. Psychiatry and Clinical Psychology, 10 (3): 188-193</p> |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Adresy na platformie eNauczanie:                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Example issues/<br>example questions/<br>tasks being completed | <p>1. Point out the wrong sentence: a. in complete dominance, the dominant allele manifests itself phenotypically in heterozygote b. in incomplete dominance, the heterozygote manifests an intermediate trait value between the phenotypes of both homozygotes c. codominance is a type of allelic gene interaction d. in incomplete dominance, heterozygotes always manifest a dominant trait</p> <p>2. Karyotype 47, XYY is an example: a. monosomy c. euploidy b. polyploidy d. aneuploidy</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Work placement                                                 | Not applicable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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