**KARTA PRZEDMIOTU**

### I. Dane podstawowe

| | |
|---|---|
| Nazwa przedmiotu | Genetyka |
| Nazwa przedmiotu w języku angielskim | Genetics |
| Kierunek studiów | Biotechnologia |
| Poziom studiów (I, II, jednolite magisterskie) | I |
| Forma studiów (stacjonarne, niestacjonarne) | stacjonarne |
| Dyscyplina | biologia |
| Język wykładowy | Grupy w języku polskim – język polski |
| | Grupy w języku angielskim – język angielski |

| | |
|---|---|
| Koordynator przedmiotu/osoba odpowiedzialna | dr hab. Hieronim Golczyk |

| Forma zajęć *(katalog zamknięty ze słownika)* | Liczba godzin | semestr | Punkty ECTS |
|---|---|---|---|
| Wykład | 30 | IV | 6 |
| konwersatorium | | | |
| ćwiczenia | 30 | IV | |
| laboratorium | | | |
| warsztaty | | | |
| seminarium | | | |
| proseminarium | | | |
| Lektorat | | | |
| Praktyki | | | |
| zajęcia terenowe | | | |
| pracownia dyplomowa | | | |
| translatorium | | | |
| wizyta studyjna | | | |

| | |
|---|---|
| Wymagania wstępne | Completed course "Basics of Cytophysiology and Ontogenesis" |

### II. Cele kształcenia dla przedmiotu

| |
|---|
| C1. To familiarize students with phenomena, concepts and genetic terms. Discussion of the basic theoretical models used in genetics. |
| C2. Presentation of the most important techniques. Discussion of selected genetic diseases in humans. |
| C3. Developing the ability to solve genetic problems. |

**III.     Efekty kształcenia dla przedmiotu wraz z odniesieniem do efektów kierunkowych**

| Symbol | Opis efektu przedmiotowego | Odniesienie do efektu kierunkowego |
|---|---|---|
| KNOWLEDGE | | |
| W_01 | Knows and understands genetic phenomena, concepts and terms and is able to define them. Can explain the basic theoretical models used in genetics and discuss selected human genetic diseases. | K_W01 |
| W_02 | Has basic knowledge of genetics and genetics techniques and their practical use. | K_W07 |
| W_03 | Has knowledge in the field of basic safety rules | K_W09 |
| SKILLS | | |
| U_01 | Uses selected basic techniques and research tools | K_U01 |
| U_02 | Observes and conducts basic measurements | K_U02 |
| U_03 | Is able to use light microscope, individually prepares microscopy preparates, conducts and describes microscopy observations | K_U03 |
| U_04 | Learns individually in the field of genetics. He is able to analyze selected problems in genetics. | K_U07 |
| U_05 | Uses selected basic statistical test to analize inherited features | K_U17 |
| SOCIAL COMPETENCES | | |
| K_01 | Understands the needs to deepen  and actualize his knowledge and skills. He is open-minded towards the application of new technologies | K_K01 |
| K_02 | Shows ability to work in a group and to discuss Cares for used laboratory equipment | K_K02 |
| K_03 | proceeds according to work safety regulations | K_K03 |

### IV. Opis przedmiotu/ treści programowe

**Lecture:**
Mendelian inheritance; non-nuclear inheritance; foundations of population genetics; the chromosomal basis of inheritance; genetic diseases of man and animals; mitosis and meiosis; gene coupling; crossing-over and chromosome mapping; karyotype structure; mutations; size of genomes; mobile elements of the genome; chromatin - structure and function; gender determination; the role of genetic processes in evolution; the most important techniques used in genetics and their importance.

**Classes:**
Practical (solving tasks) mastering the most important issues of genetics by the students, ie: Mendel's law, inheritance of simple, complex, quantitative features, gene linkage, population genetics. Human genetics. Barr body. Genetic diseases. Sex-linked traits. The use of selected statistical tools in tasks and to analyze the obtained empirical data. The course of two most important processes - mitosis and meiosis and the structure of mitotic chromosomes, karyotype and chromatin - cytological techniques and microscopic observations. Chromosome mutations. The most important techniques of genetic and cytogenetic analysis. The use of internet sources, including English-language sources in genetics.

### V. Metody realizacji i weryfikacji efektów kształcenia

| Symbol efektu | Metody dydaktyczne *(lista wyboru)* | Metody weryfikacji *(lista wyboru)* | Sposoby dokumentacji *(lista wyboru)* |
|---|---|---|---|
| KNOWLEDGE | | | |
| W_01 W_02 W_03 | conventional lecture laboratory analysis textual work | oral or written exam Test / Written test | Evaluated test / written test, written work/protocol |
| SKILLS | | | |
| U_01 U_02 U_03 U_04 U_05 | laboratory classes practical classes | Test / Written test | Evaluated test / written test, written work |
| SOCIAL COMPETENCES | | | |
| K_01 K_02 K_03 | laboratory classes practical classes | Written test | Evaluated test / written test, written work |

**VI.** **Kryteria ocen.**

| Mark | Evaluation criteria | |
|---|---|---|
| **very good (5)** | the student realizes the assumed learning outcomes at a very good level | the student demonstrates knowledge of the education content at the level of 91-100% |
| **over good (4.5)** | the student accomplishes the assumed learning outcomes an over good level | the student demonstrates knowledge of the education content at the level of 86-90 % |
| **good(4)** | the student accomplishes the assumed learning outcomes at a good level | the student demonstrates knowledge of the education content at the level of 71-85% |
| **quite good(3.5)** | the student accomplishes the assumed learning outcomes at a quite good level | the student demonstrates knowledge of the education content at the level of 66-70% |
| **sufficient (3)** | the student accomplishes the assumed learning outcomes at a sufficient level | the student demonstrates knowledge of the education content at the level of 51-65% |
| **insufficient (2)** | the student accomplishes the assumed learning outcomes at an insufficient level | the student demonstrates knowledge of the education content below the level of 51% |

**VII.** **Obciążenie pracą studenta**

| Forma aktywności studenta | Liczba godzin |
|---|---|
| Liczba godzin kontaktowych z nauczycielem | 60 |
| Liczba godzin indywidualnej pracy studenta | 90 |

**VIII.** **Literatura**

Grupy w języku polskim

| |
|---|
| Literatura podstawowa: |
| - Winter P.C., Hickey G.I., Flechter H.I. 2010. Genetyka. PWN |
| - Drewa G., Ferenc T. 2003. Podstawy genetyki. Dla studentów i lekarzy. Elsevier Urban & Partner. |
| Literatura uzupełniająca: |
| - Charon K.M., Świtoński M. 2012. Genetyka i genomika zwierząt. PWN. |
| - Berg P., Singer M. 1997. Język genów. Poznawanie zasad dziedziczenia. Prószyński i S-ka. |
| - http://www.kumc.edu/gec/ |
| - http://www.macroevolution.net/ |
| - http://www.ndsu.edu/pubweb/~mcclean/plsc431/popgen/popgen1.htm |

Grupy w języku angielskim

Basic literature:

- Flechter H.I. and Hickey G.I., 2012. BIOS Instant Notes in Genetics. Garland Science

- Griffiths AJF, Miller JH, Suzuki DT, Lewontin RC, Gelbart WM. 2000. An Introduction to Genetic Analysis. W. H. Freeman. New York.  https://www.ncbi.nlm.nih.gov/books/NBK21766/

-  Snustad DP and Simmons MJ. 2012. Principles of Genetics. Wiley.


Additional sources:

- Robinson TR. 2005. Genetics For Dummies. Wiley Publishing, Inc.

- http://www.kumc.edu/gec/

- http://www.macroevolution.net/

- http://www.ndsu.edu/pubweb/~mcclean/plsc431/popgen/popgen1.htm