Course Syllabus

I.   General Information

Course name	Genetics
Programme	Biotechnology
Level of studies (BA, BSc, MA, MSc, long-cycle MA)	BSc
Form of studies (full-time, part-time)	part-time
Discipline	Biological sciences
Language of instruction	English

Course coordinator/person responsible	dr hab. Hieronim Golczyk

Type of class *(use only the types mentioned below)*	Number of teaching hours	Semester	ECTS Points
lecture	30	IV	6
tutorial			
classes	30	IV	
laboratory classes			
workshops			
seminar			
introductory seminar			
foreign language classes			
practical placement			
field work			
diploma laboratory			
translation classes			
study visit			

Course pre-requisites	Completed course "Basics of Cytophysiology and Ontogenesis"

II.   Course Objectives

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

III. Course learning outcomes with reference to programme learning outcomes

Symbol	Description of course learning outcome	Reference to programme learning outcome
KNOWLEDGE		
W_01	presents terminology used in genetics, defines genetic phenomena and processes occurring in a living organism	K_W01
W_02	presents knowledge of genetics and genetic molecular techniques and describes their practical use	K_W06
W_03	presents the principles of occupational health and safety when using genetics techniques	K_W09
SKILLS		
U_01	Student uses selected basic genetic techniques and tools	K_U01
U_02	Student carries out observations and performs basic measurements in genetics	K_U02
U_03	For the analysis of cellular basis of genetic phenomena (e.g. cell division, chromosomes, gametogenesis) is able to use a light microscope, prepare a microscopic preparation independently, conduct and document microscopic observations	K_U03
U_04	Uses the selected basic statistical test (e.g. chi-square test) to analyze the results of genetic crosses.	K_U14
U_05	Learns independently in a targeted manner that covers genetics. Is able to solve selected types of genetic tasks / problems	K_U17
SOCIAL COMPETENCIES		
K_01	shows appropriate habits necessary to work in the genetic laboratory, acts in accordance with the principles of occupational health and safety.	K_K04

IV. Course Content

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. Didactic methods used and forms of assessment of learning outcomes

Symbol	Didactic methods *(choose from the list)*	Forms of assessment *(choose from the list)*	Documentation type *(choose from the list)*
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
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 COMPETENCIES			
K_01	laboratory classes practical classes	Written test	Evaluated test / written test, written work

VI. Grading criteria, weighting factors.....

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. Student workload

Form of activity	Number of hours
Number of contact hours (with the teacher)	60
Number of hours of individual student work	90

VIII.   Literature

Basic literature
Flechter H.I., Hickey G.I. 2013. Genetics. BIOS Instant Notes. Garland Science, Taylor & Francis Group. London and New York
Additional literature
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/   Brown TA. Genomes. Oxford: Wiley-Liss: Garland Science: https://www.ncbi.nlm.nih.gov/books/NBK21128/   Genetics Education Center: http://www.kumc.edu/gec/   Macroevolution.net: http://www.macroevolution.net/   Population and Evolutionary Genetics: http://www.ndsu.edu/pubweb/~mcclean/plsc431/popgen/popgen1.htm