DESCRIPTION OF THE COURSE OF STUDY

Course code	**0512.6.BIOT1B/C.GO**	
Name of the course in	Polish	Genetyka ogólna
	English	General genetics

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	Biotechnology
1.2. Mode of study	Stationary
1.3. Level of study	First degree
1.4. Profile of study*	General academic
1.5. Person/s preparing the course description	dr hab. Artur Kowalik, prof. UJK, dr Magdalena Trojak
1.6. Contact	artur.kowalik@ujk.edu.pl, magdalena.trojak@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	English
2.2. Prerequisites*	general chemistry, biochemistry, organic chemistry

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes		Laboratory exercises: 45 h
3.2. Place of classes		Teaching classes on the premises of UJK
3.3. Form of assessment		Written exam, Laboratory exercises: mark
3.4. Teaching methods		lecture, Laboratory exercises: practical exercises methods
3.5. Bibliography	**Required reading**	Genomes 4 T. Brown 2017 or later; Instant Notes in Genetics H. Fletcher, I. Hickey, P
	Further reading	Essential Medical Genetics Connor M., Ferguson-Smith., Essential Cell Biology Bruce Alberts, Karen Hopkin, Alexander Johnson, David Morgan, Martin Raff, Keith Roberts, Peter Walter (Autor) A. Read, D. Donnai, New Clinical Genetics, third edition 3rd Edition 2015

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives *(including form of classes)*

Lectures

C1. Acquire theoretical knowledge of classical genetics (Mendel's and Morgan's rules), population genetics (population structure, heredity and consanguinity) and molecular genetics (transcription and translation process, selected issues in biotechnology).

Classes: C1. Formation of the ability to use theoretical knowledge in practice (analysis of the results of cross breeding of Drosophila melanogaster) and solving genetic tasks.

Competencies- Able to present the obtained results of the conducted research.

4.2. Detailed syllabus *(including form of classes)*

Lectures

1. *Divisions of genetics. Basic genetic concepts. Mendel's laws. Additions and modifications of the rules of inheritance established by Mendel.*
2. *Localization of genes in chromosomes. Inheritance of sex-linked traits.*
3. *Genetic analysis of haploid eukaryotic organisms. Genetic analysis of prokaryotic organisms and viruses. Structure of the genome in eukaryotic organisms. Mutagenesis, Molecular mechanisms of mutation.*
4. *The action of mutagenic agents. Reparation and recombination of DNA. Human genetic diseases and possibilities of their treatment. Causes of cancer. The genetic code, transcription and its role in gene expression, translation. Regulation of gene expression in prokaryotes.*
5. *Mechanisms of regulation of gene expression in eukaryotes. Transposons and other mobile genetic elements. Genetic engineering. Selected issues in biotechnology. Genetic basis of cell and tissue differentiation. Genetics of development of multicellular organisms. Extranuclear inheritance. Genetic structure of populations. Changes in the genetic structure of populations. Heredity. Consanguinity.*

Classes

1. *Genetics of the fruit fly Drospohila melanogaster, observation of mutants, gender recognition, isolation and observation of polytenic giant chromosomes from the salivary glands of Drospohila melanogaster larvae, isolation of fruit fly larvae, solving genetic crossword tasks;*
2. *Observation of mitosis in cells of the apical meristems of the root of onion and garlic;*
3. *Practical exercises in methods of isolation of nucleic acids (DNA, RNA) and proteins. Analysis of gene polymorphism. Methods of electrophoretic separation of nucleic acids and proteins.*

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of **KNOWLEDGE:**		
W01	Knows and understands cellular processes at the genetic, biochemical and physiological levels	BIOT1A_W02
W02	Knows and understands to an advanced degree the issues related to genetic variability of organisms and processes occurring at the molecular level	BIOT1A_W03
within the scope of **ABILITIES:**		
...U01	Can select and apply basic research tools and methods specific to the sciences and natural sciences used in biotechnology	BIOT1A_U03
U02	Can conduct biochemical tests and analyze morphological features of organisms	BIOT1A_U06
within the scope of **SOCIAL COMPETENCE:**		
K01	Is ready to perform professional roles responsibly and follow ethical principles	BIOT1A_K03

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes *(code)*	Method of assessment (+/-)																				
	Exam oral/written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others* e.g. standardized test used in e-learning		
	Form of classes			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*		
	L	*C*	*...*	*L*	*C*	*...*	*L*	*C*	*...*	*L*	*C*	*...*	*L*	*C*	*...*	*L*	*C*	*...*	*L*	*C*	*..*
W01	+					+									+			+			
W02	+					+									+			+			
U01						+									+			+			
U02						+									+			+			
K01	+					+									+			+			

delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes

Form of classes	Grade	Criterion of assessment
lecture (L) (including e-learning)	**3**	obtaining 65-72% of the total number of points possible
	3,5	obtaining 73-78% of the total number of points possible
	4	obtaining 79-84% of the total number of points possible
	4,5	obtaining 85-90% of the total number of points possible
	5	obtaining 91% or more of the total number of points possible
classes (C)* (including e-learning)	**3**	obtaining 65-72% of the total number of points possible
	3,5	obtaining 73-78% of the total number of points possible
	4	obtaining 79-84% of the total number of points possible
	4,5	obtaining 85-90% of the total number of points possible
	5	obtaining 91% or more of the total number of points possible

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	**90**	
*Participation in lectures**	**44**	
*Participation in classes, seminars, laboratories**	**44**	
*Preparation in the exam/ final test**	**2**	
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	**60**	
*Preparation for the lecture**	**10**	
*Preparation for the classes, seminars, laboratories**	**20**	
*Preparation for the exam/test**	**30**	
TOTAL NUMBER OF HOURS	**150**	
ECTS credits for the course of study	**6**	

***delete as appropriate**

Accepted for execution *(date and legible signatures of the teachers running the course in the given academic year)*

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