DESCRIPTION OF THE COURSE OF STUDY

Course code	0512-2BIOT-C16-BM	
Name of the course in	Polish	Biologia molekularna
	English	Molecular biology

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

1.1. Field of study	Biotechnology
1.2. Mode of study	Full time
1.3. Level of study	Master's degree
1.4. Profile of study*	General academic
1.5. Person/s preparing the course description	Prof. dr hab. Anna Lankoff
1.6. Contact	anna.lankoff@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	English
2.2. Prerequisites*	none

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes		e.g. lectures, classes, (including e-learning)
3.2. Place of classes		Institut of Chemistry UJK/ Microsoft Teams online sessions
3.3. Form of assessment		lecture-exam, classes-credit with grade
3.4. Teaching methods		lectures/classes, consultation, presentation, self-study, online self-study
3.5. Bibliography	**Required reading**	1. Turner PC, McLennan AG, Bates AD, White MRH, Biologia molekularna. Krótkie wykłady (wydanie III), Wydawnictwo Naukowe PWN, Warszawa 2011 2.Allison L.A., Podstawy biologii molekularnej, Wydawnictwo Uniwersytetu Warszawskiego, Warszawa 2009 3. Brown TA, Genomy, Wydawnictwo Naukowe PWN, Warszawa 2009
	Further reading	Lewandowska Ronnegren A. Techniki laboratoryjne w biologii molekularnej. Medpharm, Wrocław 2018

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

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

Lectures:

C1- Getting to know the basic concepts and molecular mechanisms that occur in the human body

C2- Using knowledge about molecular mechanisms in everyday life and in professional work

Classes:

C1- Familiarization with basic concepts as well as molecular processes and mechanisms,

C2- Getting to know the methods used in molecular biology research

C3-Independent thinking

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

Lectures (including e-learning)

Properties of nucleic acids, Structure of prokaryotic and eukaryotic chromosomes, DNA replication, Polymerase: types and functions. Restrictases and ligases, Topoisomerases, DNA damage (spontaneous, induced by ionizing radiation, UV radiation, chemicals, food mutagens), DNA repair (direct reversion, MMR, BER, NER, HR, NHEJ). DNA cloning, Cloning vectors, Regulation of transcription in prokaryotes and eukaryotes, Cell cycle regulation: kinases/phosphatases, oncogenes, RNA maturation, Types of cell death. Transposons. Protein synthesis, Functional genomics, Selected methods used in molecular biology: PCR, immunochemistry, flow cytometry.

Lab (including e-learning)

Methods of isolation and characterization of nukeic acid isolates. Methods of protein isolation. PCR reaction and restriction analysis, agarose gel electrophoresis. Hybridization-based methods. Antibody-based methods.Classes

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of **KNOWLEDGE:**		
W01	describes the mechanisms of gene expression regulation	BIOT1A_W02
W02	knows and explains the properties and mechanisms in which nucleic acids and proteins are involved	BIOT1A_W02
W03	describes and explains the regulation of the cell cycle at the molecular level	BIOT1A_W03
within the scope of **ABILITIES:**		
U01	can discuss the application of basic methods used in molecular biology	BIOT1A_U03
U02	can perform PCR and interpret the result	BIOT1A_U06
within the scope of **SOCIAL COMPETENCE:**		
K01	is ready to critically assess the possessed knowledge and its importance in solving problems	BIOT1A_K01
K02	is ready to perform professional roles responsibly, observe the rules of professional ethics and improve professional and personal competences throughout life	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. standard-ized 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	***X***				***X***																
W02	***X***				***X***																
W03	***X***				***X***																
U01											***X***										
U02											***X***										
K01					***X***																
K01					***X***																

****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 51% - 65% of points in the written exam
	3,5	obtaining 66% - 75% of points in the written exam
	4	obtaining 76% - 85% of points in the written exam
	4,5	obtaining 86% - 95% of points in the written exam
	5	obtaining 96% - 100% of points in the written exam
classes (C)* (including e-learning)	**3**	obtaining 51% - 65% of the test points
	3,5	obtaining 66% - 75% of the test points
	4	obtaining 76% - 85% of the test points
	4,5	obtaining 86% - 95% of the test points
	5	obtaining 96% - 100% of the test points

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/	***75***	***75***
*Participation in lectures**	45	45
*Participation in classes, seminars, laboratories**	30	30
*Preparation in the exam/ final test**		
*Others (please specify e.g. e-learning)**		
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	***25***	***25***
*Preparation for the lecture**	5	5
*Preparation for the classes, seminars, laboratories**	10	10
*Preparation for the exam/test**	10	10
*Gathering materials for the project/Internet query**		
Preparation of multimedia presentation		
*Others **		
TOTAL NUMBER OF HOURS	***100***	***100***
ECTS credits for the course of study	**4**	**4**

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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