

DESCRIPTION OF THE COURSE OF STUDY

Course code	0912-7LEK-C13-IG	
Name of the course in	Polish	Inżynieria genetyczna
	English	Genetic engineering

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

1.1. Field of study	Medicine
1.2. Mode of study	Full-time
1.3. Level of study	Uniform Master's studies
1.4. Profile of study*	General academic
1.5. Specialization*	Lack
1.6. Unit running the course of study	The Faculty of Medicine and Health Sciences
1.7. Person/s preparing the course description	dr n. biol. Michał Majchrzak
1.8. Person responsible for the course of study	dr n. biol. Michał Majchrzak
1.9. Contact	zaklad.mikrobiologii@wszkielce.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Affiliation with the module	Elective
2.2. Language of instruction	English
2.3. Semesters in which the course of study is offered	4 th semester
2.4. Prerequisites*	Biochemistry Genetics Molecular Biology

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	Lectures- 15h	
3.2. Place of classes	Courses in the teaching rooms of the UJK	
3.3. Form of assessment	Credit with grade	
3.4. Teaching methods	Problem-based lecture	
3.5. Bibliography	Required reading	1. Strachan T, Goodship J., Chinnery P., Genetics and Genomics in Medicine, Garland Science 2014. 2. Natural Genetic Engineering and Natural Genome Editing, ISBN: 9781573317658.
	Further reading	1. Nicholl D. Introduction to Genetic Engineering, Cambridge University Press, Cambridge 2008.

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED TEACHING OUTCOMES

4.1. Course objectives (*lecture*)

- C1 Familiarize students with the basic methods of genetic engineering.
C2 Application of genetic engineering for the production of therapeutic proteins.
C3 Acquaintance with the subject of induced stem cells.
C4 Overview of the foundations of gene therapy and its applications.

4.2. Detailed syllabus (*lecture*)

Gene transfer to animal cells. Vectors for cloning in animals. Selectable markers for the isolation of transformants following the introduction of the foreign gene(s) into animal cells. Genetic manipulation in animals - production of transgenic animals. Reprogramming somatic cells and somatic cloning of animals. Gene transfer into plant cells. Advanced transgenic technologies: induced expression of the transgene and CRISPR-Cas technique.

Application of recombinant DNA technology for the production of therapeutic proteins and metabolic engineering. Prevention of the spread of the modified genes in the environment. Medical application of induced stem cells and tissue engineering. Basic techniques used in gene therapy and the examples of their use to correct genetic dysfunction.

Code	A student, who passed the course	Relation to teaching outcomes
within the scope of KNOWLEDGE:		
W01	determines benefits and risks arising from the presence in the ecosystem of genetically modified organisms (GMOs);	C.W10.
W02	knows the principles of combination therapies in oncology, algorithms for diagnostic and therapeutic procedures in most common human cancers;	E.W26.
W03	knows and understand the causes, symptoms, principles of diagnosis and therapeutic management of the most common hereditary diseases;	E.W35.
W04	knows regulations concerning medical experiments and conducting other medical research;	G.W9.
within the scope of ABILITIES:		
U01	analyses genetic crossing over, pedigree qualities and human diseases as well as the estimated risk of having a child with chromosomal aberrations;	C.U1.
U02	identifies indications for prenatal diagnosis;	C.U2.
U03	makes a decision on the need to perform cytogenetic and molecular tests;	C.U3.
U04	assesses the risk of disclosure of a particular disease in the offspring based on family predisposition and the influence of environmental factors;	C.U5.

4.4. Methods of assessment of the intended teaching outcomes

Teaching outcomes (code)	Method of assessment (+/-)																				
	Exam /written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others*		
	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 – W04; U01 – U04	x																				

*delete as appropriate

4.5. Criteria of assessment of the intended teaching outcomes

Form of classes	Grade	Criterion of assessment
lecture (L)	3	Lecture Achievement 61-68% of the total number of points
	3,5	Lecture Achievement 69-76% of the total number of points
	4	Lecture Achievement 77-84% of the total number of points
	4,5	Lecture Achievement 85-92% of the total number of points
	5	Lecture Achievement 93-100% and more of the total number of points

- **Thresholds are valid from 2018/ 2019 academic year**

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

Category	Student's workload
	Full-time studies
<i>NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/</i>	15
<i>Participation in lectures*</i>	15
<i>Participation in classes, seminars, laboratories*</i>	
<i>Preparation in the exam/final test*</i>	
<i>Others*</i>	
<i>INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/</i>	5
<i>Preparation for the lecture*</i>	5
<i>Preparation for the classes, seminars, laboratories*</i>	
<i>Preparation for the exam/test*</i>	
<i>Gathering materials for the project/Internet query*</i>	
<i>Preparation of multimedia presentation</i>	
<i>Others*</i>	
<i>TOTAL NUMBER OF HOURS</i>	20
ECTS credits for the course of study	1

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

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