

## DESCRIPTION OF THE COURSE OF STUDY

<b>Course code</b>	0512.6.BIOT1.B/C.GB	
<b>Name of the course in</b>	Polish	<b>Genetyka bakterii</b>
	English	<b>Bacterial genetics</b>

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

<b>1.1. Field of study</b>	<b>Biotechnology</b>
<b>1.2. Mode of study</b>	<b>Full-time studies</b>
<b>1.3. Level of study</b>	<b>First-cycle studies</b>
<b>1.4. Profile of study*</b>	<b>General academic</b>
<b>1.5. Person/s preparing the course description</b>	<b>Grzegorz Czerwonka Ph.D.</b>
<b>1.6. Contact</b>	<b>gczewonka@ujk.edu.pl</b>

### 2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

<b>2.1. Language of instruction</b>	<b>English</b>
<b>2.2. Prerequisites*</b>	<b>pass in the subject General Microbiology</b>

### 3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

<b>3.1. Form of classes</b>	Lectures, laboratory exercises	
<b>3.2. Place of classes</b>	Classes in the teaching room of the UJK	
<b>3.3. Form of assessment</b>	Lectures – exam, laboratories - credit with grade	
<b>3.4. Teaching methods</b>	Lecture, discussion, demonstration, independent experiments, project	
<b>3.5. Bibliography</b>	<b>Required reading</b>	Bacterial Genetics and Genomics Lori Snyder, Lori A.S. Snyder 2024
	<b>Further reading</b>	Genomes 5 By Terry A. Brown 2023

### 4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

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

##### *Lecture*

- C1. To learn about the structure and function of the genetic material of prokaryotic organisms.***
- C2. To learn about the mechanisms of regulation of gene expression, replication of genetic material and DNA mutation.***
- C3. To perceive the role of mechanisms regulating gene expression in bacteria.***

##### *Laboratories*

- C1. To learn the basic methods of genetic engineering.***
- C2. To plan and carry out experiments and process the results.***

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

##### Lecture

- 1 The organisation of genetic material in a prokaryotic cell. Domain structure of the nucleoid.
- 2 Regulation of gene expression.
- 3 Replication of genetic material.
- 4 Recombination, mutation, DNA repair.
5. Horizontal gene transfer.
6. Bacteriophages and the restriction and modification system.

##### Laboratory exercises

1. Isolation of genetic material using prokaryotic organisms as an example.
2. Duplication and identification of a selected DNA fragment by PCR.
3. Restriction fragment polymorphism analysis.
4. Electrophoretic separation and visualisation of DNA.
5. Horizontal gene transfer: conjugation and transformation.
6. Determination of mutagenic strength using the Ames test.

#### 4.3 Intended learning outcomes

<b>Code</b>	<b>A student, who passed the course</b>	<b>Relation to learning outcomes</b>
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within the scope of <b>KNOWLEDGE:</b>		
W01	Student describes the organisation of the genetic material and knows the biochemical processes in the bacterial cell.	BIOT1A_W02
W02	Student explains the basic methods for conducting experiments using microbial genetic engineering techniques.	BIOT1A_W09
within the scope of <b>ABILITIES:</b>		
U01	Student applies culture methods and molecular biology techniques in the analysis of microbial function with a view to their application in biotechnology.	BIOT1A_U01
U02	Student using the tools pioneered in microbiology, it is able to investigate and analyse the morphological and biochemical characteristics of genetically modified organisms.	BIOT1A_U06
within the scope of <b>SOCIAL COMPETENCE:</b>		
K01	Student is ready to evaluate his knowledge of microbial genetics	BIOT1A_K01
K02	Student is ready to conduct analyses using genetic engineering techniques with respect for ethical principles	BIOT1A_K03
K03	Student is ready to take responsibility for the tasks and apparatus entrusted to him.	BIOT1A_K04

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											+						+			
K02											+						+			
K03											+						+			

\*delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes		
Form of classes	Grade	Criterion of assessment
Lecture	3	Exam - test, 51-60% correct answers
	3,5	Exam - test, 61-70% correct answers
	4	Exam - test, 71-80% correct answers
	4,5	Exam - test, 81-90% correct answers
	5	Exam - test, 91-100% correct answers
Laboratory	3	Credit with grade - test, 51-60% correct answers
	3,5	Credit with grade - test, 61-70% correct answers
	4	Credit with grade - test, 71-80% correct answers
	4,5	Credit with grade - test, 81-90% correct answers
	5	Credit with grade - test, 91-100% correct answers

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

Category	Student's workload	
	Full-time studies	Extramural studies
<i>NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/</i>	<b>90</b>	
<i>Participation in lectures*</i>	43	
<i>Participation in classes, seminars, laboratories*</i>	45	
<i>Preparation in the exam/ final test*</i>	2	
<i>INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/</i>	<b>60</b>	

<i>Preparation for the lecture*</i>	5	
<i>Preparation for the classes, seminars, laboratories*</i>	20	
<i>Preparation for the exam/test*</i>	35	
<b>TOTAL NUMBER OF HOURS</b>	<b>150</b>	
ECTS credits for the course of study	<b>6</b>	

*\*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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