

# Basic Techniques of Genetic Engineering - opis przedmiotu

## Informacje ogólne

Nazwa przedmiotu	Basic Techniques of Genetic Engineering
Kod przedmiotu	13.9-WB-P-BTGE-S14
Wydział	Wydział Nauk Biologicznych
Kierunek	WNB - oferta ERASMUS
Profil	-
Rodzaj studiów	Program Erasmus
Semestr rozpoczęcia	semestr zimowy 2019/2020

## Informacje o przedmiocie

Semestr	1
Liczba punktów ECTS do zdobycia	6
Typ przedmiotu	obowiązkowy
Język nauczania	angielski
Syllabus opracował	• dr Ewa Bok

## Formy zajęć

Forma zajęć	Liczba godzin w semestrze (stacjonarne)	Liczba godzin w tygodniu (stacjonarne)	Liczba godzin w semestrze (niestacjonarne)	Liczba godzin w tygodniu (niestacjonarne)	Forma zaliczenia
Wykład	15	1	-	-	Egzamin
Laboratorium	45	3	-	-	Zaliczenie na ocenę

## Cel przedmiotu

The aim of the course is to present issues related to techniques of manipulation of genetic material. The aim of the laboratory classes is to familiarize the students with rules for safe work in the molecular biology laboratory and to acquire by the students the practical knowledge concerned the basic techniques of genetic engineering.

## Wymagania wstępne

Knowledge of the biochemistry, general and molecular genetics and microbiology courses.

## Zakres tematyczny

Lecture: The term "genetic engineering". To what purpose there are used the techniques of genetic engineering? The most important discoveries in molecular biology. Methods of isolation and purification of DNA. Restriction enzymes - the basic tool of genetic engineering. Another enzymes used in cloning. Vectors used in cloning experiments, - choice of the vector type appropriate to host cells. Methods used to transfer DNA into prokaryotic and eukaryotic cells. Cloning strategies. Generation of genomic and cDNA libraries. Selection and screening of recombinants.

Laboratory classes: - preparation of vector for cloning – isolation and purification of plasmid DNA, - principles of nucleic acid separation by agarose gel electrophoresis, - preparation of competent cells, - preparation of the DNA insert for cloning, - ligation, - transformation of competent cells, - restriction analysis of recombinant plasmids, - expression and purification of recombinant protein, - overexpression analysis by SDS-PAGE.

## Metody kształcenia

Lecture in the form of multimedia presentations. Laboratory classes in the classroom equipped with the appropriate analytical apparatus and equipment.

## Efekty uczenia się i metody weryfikacji osiągania efektów uczenia się

Opis efektu	Symbol efektów	Metody weryfikacji	Forma zajęć
The student can work in a team, he is responsible for entrusted equipment and materials.		• bieżąca kontrola na zajęciach	• Laboratorium
Can properly analyze and interpret the results of experiment and draw conclusions.		• kolokwium • wykonanie sprawozdań laboratoryjnych	• Laboratorium
The student appreciates the importance of acquired knowledge in solving problems in the field of basic genetic engineering techniques.		• egzamin - ustny, opisowy, testowy i inne • kolokwium	• Wykład • Laboratorium
Can use the available English literature within the range of genetic engineering techniques.		• egzamin - ustny, opisowy, testowy i inne • kolokwium • wykonanie sprawozdań laboratoryjnych	• Wykład • Laboratorium

Opis efektu	Symbole efektów	Metody weryfikacji	Forma zajęć
He practices the known techniques of genetic engineering, he can plan and perform unassisted the simple experiment. He performs more complicated experiments under the control of teacher.		• bieżąca kontrola na zajęciach	• Laboratorium
The student understands issue concerning the genetic recombination, he describes basic techniques of genetic engineering, he realizes the connection between structure and organization of genome and possibility of using particular techniques.		<ul style="list-style-type: none"> <li>• bieżąca kontrola na zajęciach</li> <li>• egzamin - ustny, opisowy, testowy i inne</li> <li>• kolokwium</li> <li>• wykonanie sprawozdań laboratoryjnych</li> </ul>	<ul style="list-style-type: none"> <li>• Wykład</li> <li>• Laboratorium</li> </ul>
The student knows and understands the rules of using the equipment of molecular biology classroom.		<ul style="list-style-type: none"> <li>• bieżąca kontrola na zajęciach</li> <li>• kolokwium</li> <li>• wykonanie sprawozdań laboratoryjnych</li> </ul>	<ul style="list-style-type: none"> <li>• Laboratorium</li> </ul>
The student performs a thorough analysis of their own competence in the field of genetic engineering techniques. He understands the need for continuous learning and improve their skills in this area.		<ul style="list-style-type: none"> <li>• egzamin - ustny, opisowy, testowy i inne</li> <li>• kolokwium</li> </ul>	<ul style="list-style-type: none"> <li>• Wykład</li> <li>• Laboratorium</li> </ul>

## Warunki zaliczenia

The lectures – the requirement of the assessment is to get pass mark credit of written examination, which lasts 90 minutes. The examination test contains 30 questions (open and closed), 60% of all of the points are required to get the pass mark credit. Laboratory classes - the requirements of the assessment criteria refer to the attendance at classes, the active participation in laboratory experiments and to get the pass mark credit of written tests with open and closed questions (above 60% of all of the points are required to get the pass mark credit) and credit of all written reports from performed laboratory experiments. The final mark consists of the average sum of all of the pass partial marks.

## Literatura podstawowa

1. Nicholl D., An Introduction to Genetic Engineering, Cambridge University Press, 2008.
2. White M.R.H., Turner P.C., McLennan A.G. & Bates A.D, Instant Notes in Molecular Biology, Bios, Oxford, 2012.
3. Primrose S.B., Twyman R. Principles of Gene Manipulation and Genomics, Wiley-Blackwell, 2006.

## Literatura uzupełniająca

1. Selected current research and review articles.

## Uwagi

Zmodyfikowane przez dr Ewa Bok (ostatnia modyfikacja: 01-05-2019 23:17)

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