

Module name	Genetic engineering a basic course
Module code	B-B.124Eng
ISCED code	0511: Biology <i>-(zostaje bez zmiany)</i>
Study cycle	I ^o
Semester	winter
Responsible for this module	Dr hab. Małgorzata Marczak, dr hab. Andrzej Mazur, prof. UMCS Department of Genetics and Microbiology email: malgorzata.marczak@poczta.umcs.lublin.pl , mazur@hektor.umcs.lublin.pl
Language of instruction	English
Website	
Prerequisites	Completed courses of genetics and microbiology
ECTS	3,5
ECTS points hour equivalents	Contact hours (work with an academic teacher) – 45 - lectures: 15 - labs: 30 Non-contact hours (students' own work) – 45 - preparation for the exam: 15 - preparation for labs: 5 - preparation of reports from laboratory exercises: 15 - literature study: 10 Total number of ECTS points for the module – 3,5
Learning outcomes verification methods	Lecture - written assessment Laboratory - mid-semester colloquia and continuous assessment
Course full description	The aim of the course is to present the possibilities of using recombination of genetic material in vitro as well as the techniques and achievements of modern molecular biology in biotechnology, biological and medical research. <u>The lecture covers the following topics:</u> Enzymes used in recombinant DNA techniques in vitro. Techniques for the production and introduction of recombinant DNA into cells. Physical mapping: genomic libraries. Determining gene function: gene "knockout", post-transcriptional gene silencing. DNA sequencing: techniques, genome sequencing projects. Principles of transcriptome analysis (nucleic acid amplification techniques with real-time detection, microarrays) and cell proteome: protein-DNA and protein-protein interactions. Application and safety of genetic engineering techniques. <u>The laboratory covers the following topics:</u> 1. DNA isolation and purification methods 2. Methods of DNA separation in agarose gels 3. Application of restriction enzymes for molecular cloning and construction of DNA physical map 4. Polymerase chain reaction 5. DNA cloning in plasmid vectors 6. Transformation of E. coli DH5 with recombinant DNA 7. Analysis of cloning results
Bibliography	Brown TA 'Genomes'

	www.dnai.org http://dnaftb.org
Learning outcomes	<p>KNOWLEDGE Understanding of basic molecular and cellular processes which occur in living organisms Ability to characterize techniques and strategies of obtaining recombinant DNA by in vitro methods Ability to explain the potential use of genetic engineering techniques in research on life processes of organisms Ability to describe the impact of genetic engineering on everyday life and areas useful for economy</p> <p>SKILLS Ability to operate basic laboratory equipment and apparatus used in recombinant DNA in vitro techniques/methods? Skill to plan simple laboratory experiments related to nucleic acids analysis and DNA recombination Ability to draw correct conclusions from performed experiments and observations Ability to use biological terminology in scientific discussions</p> <p>SOCIAL COMPETENCES Ability to evaluate the effectiveness of recombination techniques in obtaining modified organisms with desired features Being aware of the possible risks associated with the practical use of genetic engineering achievements outside laboratory scale Ability to recognize the ethical problems arising from the manipulation of genetic material, especially in relation to humans</p>
Practice	-
Teaching methods	Lecture, discussion, laboratory practice

— sformatowano: Angielski (Stany Zjednoczone)