

Subject name	Genetic Engineering	
Subject code	E.1.GEGE.SC.ECTIE.O	
Department	Department of Genetics, Plant Breeding and Seed Science	
Faculty	Faculty of Biotechnology and Horticulture	
Subject supervisor/Lecturer	Dr. Marek Szklarczyk	
General information	Teaching period	1 semester / winter or summer semester
	ECTS credit	10
	Lectures total	30 h
	Lab practicals	30 h
Objective and general description	The main goal of the course is to acknowledge students with recombinant DNA technology. The practicals cover main steps of DNA cloning in a plasmid vector	
Lectures 15 x 2 hours	<ol style="list-style-type: none"> 1. Basic concepts of DNA cloning. 2. Enzymes used in DNA/RNA manipulations. 3. Methods of DNA transfer. 4. Expression cloning in <i>Escherichia coli</i>. 5. Bacterial artificial chromosomes. 6. <i>In vitro</i> mutagenesis. 7. DNA cloning in <i>Bacillus</i>. 8. DNA cloning in yeast. 9. Genetic engineering of plant cells and transgenic plants. 10. Genetic engineering of animal cells and transgenic animals. 11. Gene cloning strategies. 12. PCR-based technologies. 13. Selected methods used for analysis of recombinant DNA molecules. 14. Chemical synthesis of nucleic acids. 15. Social perception of recombinant DNA technology. 	
Lab practicals 6 x 5 hours	<ol style="list-style-type: none"> 1. Preparation of chemically competent <i>Escherichia coli</i> cells. 2. Isolation and purification of plasmid DNA. 3. Restriction of plasmid (vector) and cloned DNA, vector dephosphorylation. 4. Electrophoresis and gel isolation of restricted DNAs. 5. Ligation of plasmid and cloned DNA, transformation of <i>Escherichia coli</i>. 6. Automated DNA sequencing. 	
Literature	<p>Old R, Primrose S (1995) Principles of Gene Manipulation. 5th Ed. Blackwell Scientific Publications</p> <p>Brown TA (2010) Gene Cloning and DNA Analysis: An Introduction. 6th Ed. Wiley-Blackwell</p> <p>Primrose SB, Twyman RM (2006) Principles of Genome Analysis and Genomics. 7th Ed. Blackwell Publishing</p> <p>Sambrook J, Russell DW (2001) Molecular cloning – a laboratory manual. 3rd Ed. Cold Spring Harbor Laboratory Press</p>	