

General Information			
Course name and code	Gene Manipulations ÚBEV/GM1/03	ECTS Credits	6
		Semester	2nd (summer)
Aims			
The aims of the course is to familiarize the students with the basic concepts in genetic manipulations; to explains versatile tools and techniques employed in genetic engineering and recombinant DNA technology; and to appraise the students about applications of genetic engineering and manipulations in medicine, agriculture, biology, forensics and other areas of technology.			
Contents			
<ol style="list-style-type: none"> 1. Recombinant DNA techniques (DNA cloning, restriction endonucleases, vectors, selection markers, transformation methods). 2. Gene libraries (genomic libraries, cDNA libraries) 3. DNA cloning in E. coli, DNA cloning in other hosts 4. PCR (principle, nested PCR, random PCR, other amplification techniques) 5. DNA sequencing (Maxam-Gilbert, Sanger methods, NGS, genomics) 6. In vitro mutagenesis 7. CRISPr/CAS systems 8. Single gene expression analysis, transcriptomics 9. Heterologous expression of proteins 10. Practical applications of recombinant DNA techniques 11. Introductory bioinformatics (Biological databases, blast search, phylogenetic analyses) 			
Evaluation			
Grading Scale (in %): A ... 100 - 91%, B ... 90 - 81%, C ... 80 - 71%, D ... 70 - 61%, E ... 60 - 51%, Fx ... < 51%			
<p>Grading System:</p> <p>The University recognises the following six degrees for the evaluation of the study results:</p> <ol style="list-style-type: none"> a) A – excellent (excellent results) (numerical value 1) b) B – very good (above average results) (1.5) c) C – good (average results) (2) d) D – satisfactory (acceptable results) (2.5) e) E – sufficient (results meet the minimum criteria) (3) f) FX –failed (requires further work) (4) 			
Bibliography			
<p>Glick, B.R., Patten, C.L. (2017) Molecular Biotechnology: Principles and Applications of Recombinant DNA, Fifth Edition. ISBN: 9781555819361, John Wiley & Sons.</p> <p>Brown, T. A. (2016). Gene cloning and DNA analysis: an introduction. ISBN: 9781119072560, John Wiley & Sons.</p> <p>Howe, C. (2007). Gene cloning and manipulation. ISBN: 9780511807343, Cambridge University Press.</p>			