

Level: bachelor				
Course title: Applied Biochemistry, IB-602				
Status: optional				
ECTS: 5				
Requirements: -				
Learning objectives The objective of the course is to provide the students with novel overview of the use of biotechnological processes (the use of microbial, animal or plant cells, or enzymes) for the production of specific products from different raw materials. Students obtain the competence to evaluate two main features of biotechnology: its connections with practical applications and interdisciplinary cooperation.				
Learning outcomes Knowledge and comprehension of the use of various enzymes, microorganisms, animal/plant cells for technological purposes. The obtained knowledge is applicable in different fields of healthcare, plant and animal agriculture, solving many environmental problems, the conservation and recycling of resources, in creation of specific molecular converters (bioreactors) and novel fermenters to optimise productivity. Use of literature, data collection and interpretation, oral and written reporting.				
Syllabus Safety in biotechnology, social, moral and ethical considerations on genetic engineering; documentation. Intellectual property: publishing and patenting. Industrial enzyme preparations: screening sources, preparation of biological material, production optimization. Large-scale preparation of technical enzymes, methods (homogenisation, centrifugation, filtration, biphasic systems, cell breakage, chromatographies). Immobilized enzymes: economic aspects, coupling methods, examples. Enzymes on the market: food industry (starch processing, vegetable and fruit processing, brewing industry, juice- and winemaking, enzymes for dairy products and animal feed), laundry detergents, tanning industry, textile industry, paper industry, food analysis. Genetic engineering. Biosensors. Biotechnology in medicine: clinical use of enzymes, determination of enzyme activities for clinical diagnosis, examples of enzymes in different diseases; biopharmaceuticals; gene therapy; stem cells biotechnology. Role of enzymes in the remediation of polluted environments.				
Weekly teaching load				Other: written exam
Lectures: 2	Exercises: 2	Other forms of teaching: -	Student research: seminar work	