

FACULTY OF CHEMISTRY					
SUBJECT CARD					
Name of subject in Polish	Podstawy biotechnologii				
Name of subject in English:	Fundamentals of biotechnology				
Main field of study (if applicable):	Chemical technology				
Specialization (if applicable):	Technology of Fine Chemicals				
Profile:	academic				
Level and form of studies:	2nd level, full-time				
Kind of subject:	obligatory				
Subject code:	BTC024021				
Group of courses:	NO				
	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30				
Number of hours of total student workload (CNPS)	60				
Form of crediting	Examination				
For group of courses mark final course with (X)					
Number of ECTS points	2				
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes	1				
PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES					
1. Biological background at academic level					
2. Knowledge of the basics of microbiology					
SUBJECT OBJECTIVES					
C1 Understanding the uniqueness of the biological technological process.					
C2. Acquiring the basic knowledge about useful industrial biocatalysts.					
C3. Learning about examples of biotechnologically produced consumer goods.					
SUBJECT LEARNING OUTCOMES					
relating to knowledge:					
PEK_W01 Student is able to characterize the types of biotechnological processes and ways to conduct them.					
PEK_W02 Student know how to characterize bioproduction methods of exemplary consumer goods, including fine chemicals.					
PEK_W03 Student knows the use of biocatalysis as a technique for the synthesis of compounds of commercial importance.					
PEK_W04 Students knows how to use biotechnology in environmental protection and agriculture.					
PROGRAM CONTENT					
Lectures					Number of hours
Lec 1	Introduction - Biotechnology: definition and historical approach. Colors of biotechnology. Basic types of biotechnological processes.				2
Lec 2	Biotechnological process - Bioreactors. Isolation and improvement of industrially relevant microorganisms.				2
Lec 3	Biotechnology process - Fermentation as a method of fine chemicals production - exemplary industrial processes.				4

Lec 4		
Lec 5	Introduction to biotransformation: Fundamentals of biochemical characteristics of enzymes. Precision of the biocatalyst - chemo-, regio- and stereoselectivity.	2
Lec 6	Biotechnology process: biotransformation: enzyme vs whole cell- biocatalyst, methods of preparation and modification of biocatalyst.	2
Lec 7	Biotechnology process: biotransformation: methods of biocatalyst preparation and modification, reaction environment. Facts and myths about biocatalysis	2
Lec 8	Biotechnology process: biotransformation as a tool for the synthesis of chiral building blocks	2
Lec 9	Biotechnology process - biocatalysis as a technique for obtaining compounds of the "fine chemicals" type - industrial production.	2
Lec 10	Industrial application of biocatalysis - HFCS production process	2
Lec 11	Food biotechnology: brewing	2
Lec 12	Food biotechnology: dairy products	2
Lec 13	Agrobiotechnology. The importance and examples of the use of transgenic plants.	2
Lec 14	Biotechnology in environmental protection. Biological methods of wastewater treatment. Bioremediation technologies. Characteristics of the phytoremediation process.	2
Lec 15	Perspectives and new trends in biotechnology.	2
	Total hours	30
TEACHING TOOLS USED		
N1. Multimedia presentation.		
EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT		
Evaluation (F – forming (during semester), P – concluding (at semester end))	Learning outcomes number	Way of evaluating learning outcomes achievement
C	PEK_W01- PEK_W04	Final exam (Test) 3.0 if 50-55% of points 3.5 if 56-60% of points 4.0 if 61-70% of points 4.5 if 71-80% of points 5.0 if 81-95% of points 5.5 if 96-100% of points
PRIMARY AND SECONDARY LITERATURE		
PRIMARY LITERATURE:		
[1] Industrial biotechnology : sustainable growth and economic success / ed. by Wim Soetaert, Erick J. Vandamme. Weinheim : Wiley-VCH, 2012 [2] Biotechnology/ ed. by Ulrich Kück; Nicole Frankenberg-Dinkel; De Gruyter, 2015 [3] Kurt Faber Biocatalysis in organic synthesis/ ed. Wolf-Dieter Fessner; Nicholas J Turner; C. C. R Allen, tomy 1-3, Stuttgart : Georg Thieme Verlag KG, 2015 (all positions available in paper or electronic form at BG PWr)		
SECONDARY LITERATURE:		
[1] [1] Scientific literature (publications) in the field of the presented material		
SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)		
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