FACULTY OF CHEMISTRY

SUBJECT CARD

Name in English	Biotechnology with introduction to industrial microbiology
Name in Polish	Biotechnologia z elementami mikrobiologii przemysłowej
Specialization (if applicable)	
Profile:	academic
Level and form of studies:	2nd level – supplementary semester /full-time
Kind of subject	obligatory
Subject code	W03W03-SM2007W, W03W03-SM2019P
Group of courses	NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30			15	
Number of hours of total student workload (CNPS)	50			50	
Form of crediting	crediting with grade			crediting with grade	
For group of courses mark (X) final course					
Number of ECTS points	2			2	
including number of ECTS points for practical (P) classes				2	
including number of ECTS points for direct teacher-student contact (BU) classes	1,3			0,75	

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1.

SUBJECT OBJECTIVES

C1 Cognoscence of structure and functions of basic cells structures
C2 Cognoscence of fundamentals of gaining energy and nitritienst requirmenst of living cells
C3 Cognoscense of possibilities of application of living systems in biotechnology and industrial mmicrobiology - fundamentals

SUBJECT EDUCATIONAL EFFECTS

related to knowledge:

PEU_W01 – Student knows the structures and functions of macromolecules building living cells
PEU_W02 – Student knows the basics about cells metabolism
PEU_W03 – Student knows the basic methods of introduction of living systems into the industrial technology

Related to skills

PEU_U01 – Students can apply the principles of biotechnology to prepare the presentation on defined subject from the area of modern biotechnology

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours
Lec 1	Fundamentals: proteins – general structure and functions	2
Lec 2	Fundamentals: proteins – general structure and functions	2
Lec 3	Fundamentals: – enzymes – classification and mode of action	2
Lec 4	Fundamentals: – enzymes – classification and mode of action	2
Lec 5	Fundamentals: – redox cycle in living cells	2
Lec 6	Fundamentals: – energy gaining cycle in living cells	2
Lec 7	Fundamentals: – nutrition requirements of microbes (bacteria and fungi)	2
Lec 8	Fundamentals: – basics of microbiological techniques	2
Lec 9	Fundamentals: – basics of microbiological techniques	2
Lec 10	Fundamentals: – methodology of scaling of microbial processes	2
Lec 11	Fundamentals: – methodology of scaling of microbial processes	2
Lec 12	Industrial processes with microbes - examples	2
Lec 13	Industrial processes with microbes - examples	2
Lec 14	Subjects repetitions. Final colloquium – I attempt.	2
Lec 15	Subjects repetitions. Final colloquium – II attempt.	2
	Total hours	**30**

Project		**Number of hours**
Proj 1	Students presentation of novel trends in industrial microbiology	15

TEACHING TOOLS USED	
N1	Lecture – multimedia presentation
N2	Project – multimedial presentation

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT		
Evaluation F – forming (during semester), P – concluding (at semester end)	Educational effect number	Way of evaluating educational effect achievement
P - lecture	PEK_W01- PEK_W03	Colloquium
P-project	PEK_U01	Grading of individual presenattion

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

„ Modern Industrial Microbiology and Biotechnology**”** Second Edition**,** Okafor Nduka**;** 2018**,** ISBN13

(EAN): 9781138550186

SUBJECT SUPERVISOR
(NAME AND SURNAME, E-MAIL ADDRESS)

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