

Wzór przewodnika po przedmiocie - wersja angielska
Syllabus template

Course title: Industrial microbiology		
Programme: Biotechnology		Code: 4.2
Type of course:	Course level: II degree	Semester: I
Form of classes: Lecture, laboratory	Number of hours per week/meeting: 2 L^E, 2L	Credit points: 5 ECTS
Education profile: academic		Course language: English
Enrolment: yes		

GUIDE TO THE SUBJECT

I. COURSE CHART

COURSE OBJECTIVES

- C.1.** Transfer of basic knowledge in the field of industrial microbiology
- C.2.** Knowledge of microbiological processes used in technique

PRELIMINARY COURSE REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

- 1.** Basic knowledge of general microbiology
- 2.** Basic knowledge of chemistry
- 3.** Basic knowledge in molecular biology

LEARNING OUTCOMES

- EK 1** - knows and is able to characterize groups of microorganisms of industrial importance
- EK 2** - knows and explains the mechanisms of synthesis of metabolites of industrial importance
- EK 3** - knows the rules for the selection, improvement and storage of industrial strains
- EK 4** - can describe the specific properties that determine the usefulness of microorganisms in industry
- EK 5** - can describe the microbiological processes used in industry

COURSE CONTENT

Form of classes - lectures	Hours
Importance of industrial microbiology - directions of technical use of microorganisms	2
Characteristics of industrial microorganisms (bacteria, archaea, fungi, algae), extremophilic microorganisms	6
Primary and secondary metabolism - overproduction of metabolites	4
Microbial cell metabolism control techniques (changes in environmental conditions, mutagenisation, gene recombination)	6
Major industrial bioprocesses (biosynthesis, fermentation, biotransformation), features determining the usefulness of microorganisms in industrial bioprocesses	2
Perfecting production characteristics of microorganisms	2
Acquisition of industrial strains (methods of isolation, selection and breeding)	2
Storage of strains and starter cultures	2
Contamination of industrial bioprocesses - causes and effects	2
New directions of development of industrial microbiology	2
Form of classes - laboratory	Hours
Introduction to laboratory exercises. General safety rules and regulations	2
Isolation of microorganisms of industrial importance from environmental samples - isolation of proteolytic microorganisms from soil samples, isolation of pure cultures	6
Conditions of cultures microorganisms and their impact on productivity production of bioproducts (metabolic control)	6
Biosynthesis of secondary metabolites - identification and determination of biological activity of antibiotics	6
Control of sanitary and hygienic condition of industrial plant	4
Methods of storing clean cultures of microorganisms of industrial importance	4
Final test laboratory exercises	2

COURSE STUDY METHODS

1. multimedia presentation
2. devices and equipment used in the laboratory
3. information panels and educational guides

METHODS OF ASSESMENT (F - formative; S - summative)

F1. – activity in classes
F2. – evaluation of laboratory exercises
S1. – exam
S2. – test

STUDENT WORKLOAD

Form of activity	Workload (hours)
Participation in lectures	30 h
Participation in classes	- h
Laboratory	30 h
Participation in project classes	- h
Participation in seminar	- h

Preparation course on e-learning	- h
Test	2 h
Entrance test for laboratory classes	2 h
Project's defence	- h
Exam	10 h
Consultation hours	10 h
DIRECT TEACHING, hours/ ECTS	84 h / 2,625 ECTS
Preparation for tutorials	- h
Preparation for laboratories	46 h
Preparation for projects	- h
Preparation for seminars	- h
Preparation for e-learning classes	- h
Participation in e-learning classes	- h
Working on project	- h
Preparation for tests	10 h
Preparation for exam	20 h
SELF-STUDY, hours/ ECTS	76 h / 2,375 ECTS
TOTAL (hours)	∑ 160 h
TOTAL ECTS	5 ECTS

PRIMARY AND SUPPLEMENTARY TEXTBOOKS

Michael J. Waites, Neil L. Morgan, John S. Rockey, Gary Higton, *Industrial Microbiology: An Introduction*, London, UK, 2001 by Blackwell Science Ltd.

Nduka Okafor, *Modern Industrial Microbiology and Biotechnology*, Science Publishers, 2007.

SUBJECT COORDINATOR (NAME, SURNAME, E-MAIL ADDRESS)

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NAME OF LECTURER (s) (NAME, SURNAME, E-MAIL ADDRESS)

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Learning outcome	In relation to the learning outcomes specified for the field of study	Course objectives	Course content	Course study methods	Methods of assesment
EK1	K_W06, K_W07, K_W12, K_U02, K_U04, K_U06, K_U09, K_K01,	C1	Lecture/laboratory	1,2,3	F1, F2, S1, S2

	K_K06, K_K08				
EK2	K_W06, K_W07, K_W12, K_K01, K_K06, K_K08	C1,C2	Lecture	1,3	F2, S1, S2
EK3	K_W06, K_W07, K_W12, K_K01, K_K06, K_K08	C1	Lecture	1,3	F2, S1, S2
EK4	K_U02, K_U04, K_U06, K_U09	C2	laboratory	2,3	S2
EK5	K_W01, K_W05, K_W06, K_W07, K_W12, K_U02, K_U04, , K_U06, K_U09, K_K01, K_K06, K_K08	C2	Lecture/la boratory	1,2,3	F1, F2, S1, S2

II. OTHER USEFUL INFORMATION

1. All the information on the class schedule is posted on the student information board and online at: www.is.pcz.pl
2. The information about the consultation hours is provided to students on the first class meeting and posted online at ...
3. The information on course completion and grade is provided to students on the first class meeting.