

Course title: Ecotoxicology		
Programme: Biotechnology		Code: 5.10
Type of course: elective	Course level: I	Semester: III
Form of classes: lectures, tutorials	Number of hours per week/meeting: 2h L, 2h T	Credit points: 4 ECTS
Education profile: academic		Course language: English
Enrolment: yes		

GUIDE TO THE SUBJECT

I. COURSE CHART

COURSE OBJECTIVES

- C.1. Transfer of knowledge on the issue of classification of poisons, their mechanisms of toxicity and fate in the body
- C.2. Transfer of toxicological bases to assess risks to human health and the environment resulting from the presence in the environment of toxic compounds
- C.3. To acquaint students with methods of limiting health risks caused by xenobiotics.

PRELIMINARY COURSE REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of inorganic and organic chemistry, biochemistry and microbiology, within the scope of the program of studies.

LEARNING OUTCOMES

- EK 1 - Can list and characterize the fundamental changes that xenobiotics undergo in the body and environment.
- EK 2 - Can define toxic substances and their potential sources in the environment.
- EK 3 - Has basic knowledge about the possibilities of using bioprocesses in selected branches of economy.
- EK 4 - Has the ability to use biotechnology in engineering and environmental protection, forestry and food technology.

COURSE CONTENT

Form of classes - lectures	Hours
Definition of toxicology and ecotoxicology, types, causes and structure of poisoning	2
Factors determining toxicity	4
Xenobiotics metabolism	2
Bioaccumulation	2
Heavy metals in the environment	2

Durable organic pollutants	2
Toxic substances in the food chains	2
Fate of toxic substances in the ecosystem	2
Decomposition of organic matter in terrestrial ecosystems	2
Contamination in aquatic environments	2
Use biotechnology to remove organic and inorganic pollutants	4
Toxicology of food	2
Test from lectures	2
Form of classes – tutorials	Hours
Organizing classes, handing over literature to prepare presentations	2
What are environmental health hazards? The specificity of environmental health hazards	2
Health effects of human exposure to environmental pollution	2
Factors influencing the amount of risk. Types of threats and media that carry risk	2
Special risk factors. Toxic effect of selected substances	2
Nanoparticles and health hazards	2
Heavy metal contamination of agricultural and forest soils	2
Heavy metals. Dangers of children's health	2
Methods of removing heavy metals from the environment	2
Pesticides and herbicides	2
Bioremediation of organic compounds from soils	6
Hazards caused by landfills and waste incineration plants	2
Final test	2

COURSE STUDY METHODS

1. blackboard, interactive whiteboard
2. multimedia presentation

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

F1. – activity in classes
S1. – Test from lectures
S2. – Test from tutorials

STUDENT WORKLOAD

Form of activity	Workload (hours)
Participation in lectures	30 h
Participation in classes	30 h
Laboratory	-
Participation in project classes	-
Participation in seminar	-
Preparation course on e-learning	-
Test	2 h
Entrance test for laboratory classes	-
Project's defence	-
Exam	-
Consultation hours	10h

DIRECT TEACHING, hours/ ECTS	72 h / 4 ECTS
Preparation for tutorials	38 h
Preparation for laboratories	-
Preparation for projects	-
Preparation for seminars	-
Preparation for e-learning classes	-
Participation in e-learning classes	-
Working on project	-
Preparation for tests	30 h
Preparation for exam	-
SELF-STUDY, hours/ ECTS	68 h / 4 ECTS
TOTAL (hours)	∑ 140 h
TOTAL ECTS	4ECTS

PRIMARY AND SUPPLEMENTARY TEXTBOOKS

Walker, C. H. Principles of ecotoxicology 4th ed.: Boca Raton, Fla.: CRC, 2012
Connell D., Lam P., Richardson B. and Wu R. Introduction to ecotoxicology. 1999. Blackwell Science ISBN 0 0632 03857 7
Ecotoxicology, 1st Edition, Erik Jorgensen, eBook ISBN: 9780444536297, Hardcover ISBN: 9780444536280, Imprint: Academic Press, Published Date: 30th April 2010
Handbook of Ecotoxicology, 1998 Blackwell Science Ltd, Peter Calow, 2009, Print ISBN: 9780632049332, Online ISBN: 9781444313512

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

Dr Anna Grobelak, agrobelak2is.pcz.czest.pl

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

Dr Anna Grobelak, agrobelak2is.pcz.czest.pl Dr hab. inż. Ewa Stańczyk-Mazanek Prof. P.Cz., stanczyk@is.pcz.czest.pl
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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
EK 1	K_W01, K_W05, K_W11, K_W15, K_U01, K_U06 K_K02	C.1	Lecture /Tutorial	1, 2	F1, S1, S2
EK 2	K_W01, K_W05, K_W11, K_W15,	C.2	Lecture /Tutorial	1, 2	F1, S1, S2

	K_U01, K_U06 K_K02				
EK 3	K_W01, K_W05, K_W11, K_W15, K_U01, K_U06 K_K02	C.2	Lecture /Tutorial	1, 2	F1, S1, S2
EK 4	K_W01, K_W05, K_W11, K_W15, K_U01, K_U06 K_K02	C.3	Lecture /Tutorial	1,2	F1, 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 www.is.pcz.pl
3. The information on course completion and grade is provided to students on the first class meeting.