

**DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND TECHNOLOGY**

SUPERVISOR/TEAM/ DECLARING/CONDUCTING COURSE: .....  
 DEPARTMENT Unit of Sanitary Biology and Ecotechnics  
 Faculty of Environmental Engineering

**COURSE CARD**

**Course name in Polish:** Ekotoksykologia i bezpieczeństwo środowiskowe

**Course name in English:** Ecotoxicology and environmental safety

**Course language Polish / English\***

**University-wide general course type\*:**

- 1) basic science course (mathematics, physics, chemistry, computer science or other) : 2)
- humanities course: .....
- 3) management course: .....
- 4) English language: .....
- 5) didactics of higher education course: .....

**Specialized courses for PhD students receiving education in discipline\*:** .....

- 1) specialized course in discipline: environmental engineering
- 2) interdisciplinary course in the field of several disciplines: .....
- 3) seminar in discipline or interdisciplinary: .....

**Subject code: IGQ100187W**

\* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	30			
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

- 1. Has basic knowledge in biology,
- 2. Has basic knowledge in chemistry

**COURSE OBJECTIVES**

- C1. Acquiring knowledge on basic rules and applications of ecotoxicology and environmental safety
- C2. Environmental safety assessment

**DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND  
TECHNOLOGY**

**PROGRAM CONTENTS**

<b>Form of classes – lecture (Lec)</b>		<b>Number of hours</b>
Lec1	Introduction, requirements, purpose and content of the course.	2
Lec2	Biological methods for assessing the quality of the environment.	2
Lec3	Analysis of integrated mechanisms related to long- and short-term ways and interactions of compounds and chemicals in the environment and their bioavailability and assimilation in living organisms (I)	2
Lec4	Analysis of integrated mechanisms related to long- and short-term ways and interactions of compounds and chemicals in the environment and their bioavailability and assimilation in living organisms (II)	2
Lec5	Discussion and analysis of the response of living organisms and their defense mechanisms: disorders of the hormonal system.	2
Lec6	Discussion and analysis of the response of living organisms and their defense mechanisms: genotoxicity.	2
Lec7	The fate of toxic compounds in the environment, trophic chains (not excluding human).	2
Lec8	Modern tools in ecotoxicology: the use of biomarkers.	2
Lec9	Modern tools in ecotoxicology: the use of biosensors.	2
Lec10	Modern tools in ecotoxicology: the use of bioanalytical methods.	2
Lec11	Modern tools in ecotoxicology: the use of bioremediation methods.	2
Lec12	Modern tools in ecotoxicology: the use of models and their application in interdisciplinary ecotoxicology, QSAR (Quantitative structure-activity relationship), QSPR (Quantum chemical predictions of toxicity).	2
Lec13	Case studies	2
Lec14	Environmental safety assessment. Characteristics, prediction as well as environmental risk management.	2
Lec15	Environmental safety assessment. Characteristics, prediction as well as environmental risk management.	2
<b>Total hours:</b>		<b>30</b>

**TEACHING TOOLS USED**

N1. Information lecture  
N2. Problematic lecture

**ACHIEVED SUBJECT LEARNING OUTCOMES**

<b>Type of learning outcome</b>	<b>Code of learning outcome</b>	<b>Assessment of learning outcome</b>
Knowledge	PS8_WG	Student has advanced knowledge of directional subjects in a given discipline or in interdisciplinary subjects. Student has knowledge at an advanced level of discipline and subject matter relevant to the field of research carried out, including the most recent research findings and scientific achievements.
Skills	PS8_UW	Student has scientific and technological skills relevant to methods and methodology of conducting

**DOCTORAL SCHOOL OF WROCLAW UNIVERSITY OF SCIENCE AND  
TECHNOLOGY**

		scientific research and critical evaluation of the results obtained.
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**PRIMARY AND SECONDARY LITERATURE**

**PRIMARY LITERATURE:**

- [1] Toksykologia środowiska; Stanley E. Manahan; Wydawnictwo Naukowe PWN, 2012
- [2] Toksykologia; pod redakcją Witolda Seńczuka; Wydawnictwo PZWL, 2005
- [3] Hoffman D. J., Barnett A. Rattner, Allen Burton G.Cairns J. Handbook of ecotoxicology. Lewis Publishers, 2003
- [4] Hodgson E., A textbook of modern toxicology, Wiley Interscience, Hoboken, New Jersey, 2004.

**SECONDARY LITERATURE:**

- [1] Principles and Practice of Toxicology in Public Health, Ira S. Richards, Marie Bourgois Jones and Barlett Publishers 2007
- [2] Essentials of Environmental Toxicology. The Effects of Environmentally Hazardous Substances on Human Health W. William Hughes. Taylor and Francis 2005
- [3] Casarett and Doull's Toxicology. The Basic Science of Poisons Curtis D. Klaasen. New York 2013

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

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