

UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN  
of Environmental Sciences

## A list of syllabus subjects

**Field of study**

Environmental Engineering

**Speciality area**

**Level of study**

**Programm code**

4907-SMU-PEEPB\_KRK



**ANALYTICAL TRAINING**

**ECTS: 2**  
**YEAR: 2018L**

**COURSE CONTENT**  
**CLASSES:**

**LECTURES:**

**EDUCATIONAL OBJECTIVE:**

**DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR LEARNING OUTCOMES**

Codes of learning outcomes in a major field of study: T2A\_K02+, T2A\_K03+, T2A\_K04+, T2A\_K06+, T2A\_U07+, T2A\_U12+, T2A\_U19+, T2A\_W01+,

Codes of learning outcomes in a major area of study: K2\_K01+, K2\_U05+, K2\_U12+, K2\_W02+,

**LEARNING OUTCOMES:**

**Knowledge**

W1 - Students have knowledge of the principles of determining chemical indicators in samples environmental (water, sewage, soil) and sample preparation for analysis

**Skills**

U1 - Students are able to perform chemical analyzes of environmental samples, calculate the values of indicators and express them in appropriate units

U2 - Students will acquire the ability to use laboratory equipment spectrophotometer, microwave oven, atomic absorption spectrometer, liquid chromatograph, tensiometer)

**Social competence**

K1 - Students are able to interact and work in a group, are aware of the importance of analytical methods in monitoring the quality of the environment, set priorities for achieving objectives

**BASIC LITERATURE**

1) Bułkowska K., Kulikowska D., Gusiatin Z.M., Analytical training. Laboratory handbook, wyd. Katedra Biotechnologii w Ochronie Środowiska, 2016 ; 2) American Public Health Association (APHA), Standard Methods for the Examination of Water and Wastewater, 18th ed, wyd. American Public Health Association, Washington, , 1992

**SUPPLEMENTARY LITERATURE**

1) ) S. Hooda, Trace Elements in Soils, wyd. Wiley-Blackwell, 2010

<b>Course / module</b>	
Analytical training	
<b>Fields of education:</b>	
Obszar nauk technicznych	
<b>Course status:</b>	facultative
<b>Course group:</b>	brak
<b>ECTS code:</b>	
<b>Field of study:</b>	Environmental Engineering
<b>Specialty area:</b>	
<b>Educational profile:</b>	General academic
<b>Form of study:</b>	Stacjonarne
<b>Level of study:</b>	Drugiego stopnia/ masters
<b>Year/Semester:</b>	1 / 1

<b>Type of course:</b>	
Laboratory classes	
<b>Number of hours per semester/week:</b>	Laboratory classes: 30
<b>Teaching forms and methods</b>	
Laboratory classes(K1, U1, U2, W1) :	
<b>Form and terms of the verification results:</b>	
LABORATORY CLASSES: Report - null(K1, U1, U2, W1) ;LABORATORY CLASSES: Competention test - null(K1, W1)	
<b>Number of ECTS points:</b>	2
<b>Language of instruction</b>	polski
<b>Introductory courses:</b>	
<b>Preliminary requirements:</b>	

<b>Name of the organizational unit offering the course:</b>	
Katedra Biotechnologii w Ochronie Środowiska,	
<b>Person in charge of the course:</b>	
dr hab. inż. Zygmunt Gusiatin,	
<b>Course coordinators:</b>	
dr hab. inż. Zygmunt Gusiatin, , dr inż. Katarzyna Bułkowska, , dr hab. inż. Tomasz Pokój, , Temesgen Sibhatu Habtu,	

<b>Notes:</b>	
work in groups of 2-3 people	

## Detailed description of the awarded ECTS points - part B

**ECTS:2**  
**YEAR: 2018L**

### **ANALYTICAL TRAINING**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: laboratory classes	30 h
- consultation	2 h
	32 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 32 h : 1 h/ECTS = 32,00 ECTS  
average: **2 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	32,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-30,00 ECTS points,



**BIOLOGICAL WASTEWATER TREATMENT**  
**BIOLOGICAL WASTEWATER TREATMENT**

**ECTS: 3,5**  
**YEAR: 2018L**

**COURSE CONTENT**  
**CLASSES:**

**LECTURES:**

**EDUCATIONAL OBJECTIVE:**

**DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR LEARNING OUTCOMES**

Codes of learning outcomes in a major field of study: T2A\_K02++, T2A\_K03++, T2A\_K04++, T2A\_K06++, T2A\_U09+, T2A\_U10+, T2A\_U11+, T2A\_U16+, T2A\_U18+, T2A\_U19+, T2A\_W01+, T2A\_W02+, T2A\_W03+,

Codes of learning outcomes in a major area of study: K2\_K01++, K2\_U07+, K2\_U15+, K2\_W03+, K2\_W06+, K2\_W09+,

**LEARNING OUTCOMES:**

**Knowledge**

W1 - The student will: know the typical configuration of the wastewater treatment. Understanding the principle of the biological methods of wastewater treatment. Familiar with biological processes like nitrification and denitrification. Know the rules of nitrification, denitrification processes

W2 - Become familiar with the biological and chemical methods for phosphorus removal. Knows the biological and chemical process for phosphorus removal

W3 - Understand the principle of the co-removal process of the emerging contamination

**Skills**

U1 - The student will be able to choose proper solution of the biological system for wastewater treatment. Know how to design 1th, 2th, 3th stages of the activated sludge system; be able to design a nitrogen removal activated sludge system

U2 - The student will be able to design a phosphorus removal activated sludge system and chemical step for polishing the wastewater

**Social competence**

K1 - Understand the meaning of the biological principle for technical solutions

K2 - Knows how the importance of the link between biological and technical aspects in the case of new micropollutants in wastewater

**BASIC LITERATURE**

1) H.J Jordning, J Winter Wiley-Vch, Environmental Biotechnology, wyd. Amazon, 2005 ; 2) Edit by: P. Aarne Vesilind et al, Wastewater treatment plant design, wyd. IWA Publishing, 2003 ; 3) McGraw-Hill, , Engineering (Treatment, Disposal, Reuse) , wyd. International Editions, 1991

**SUPPLEMENTARY LITERATURE**

**Course / module**

Biological wastewater treatment

**Fields of education:**

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:**

**Field of study:** Environmental Engineering

**Specialty area:**

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/ masters

**Year/Semester:** 1 / 1

**Type of course:**

Lecture, Auditorium classes

**Number of hours per semester/week:** Lecture: 10, Auditorium classes: 20

**Teaching forms and methods**

Lecture(K1, K2, W1, W2, W3) ; Auditorium classes(U1, U2) :

**Form and terms of the verification results:**

LECTURE: Written exam - null(K1, K2, W1, W2, W3) ;AUDITORIUM CLASSES: Written test - null(U1, U2, W3)

**Number of ECTS points:** 3,5

**Language of instruction** angielski

**Introductory courses:**

**Preliminary requirements:**

**Name of the organizational unit offering the course:**

Katedra Biotechnologii w Ochronie Środowiska,

**Person in charge of the course:**

prof. dr hab. inż. Irena Wojnowska-Baryła,

**Course coordinators:**

prof. dr hab. inż. Irena Wojnowska-Baryła,

**Notes:**

brak

## Detailed description of the awarded ECTS points - part B

**ECTS:3,5**  
**YEAR: 2018L**

### **BIOLOGICAL WASTEWATER TREATMENT** **BIOLOGICAL WASTEWATER TREATMENT**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: auditorium classes	20 h
- participation in: lecture	10 h
- consultation	4 h
	34 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 34 h : 1 h/ECTS = 34,00 ECTS  
average: **3,5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	34,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-30,50 ECTS points,



ECTS: 3,5  
YEAR: 2018L

## BIOTECHNOLOGY IN ENVIRONMENTAL PROTECTION BIOTECHNOLOGY IN ENVIRONMENTAL PROTECTION

### COURSE CONTENT CLASSES:

### LECTURES:

### EDUCATIONAL OBJECTIVE:

### DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study:	T2A_K01+, T2A_K02+, T2A_K03+, T2A_K04+, T2A_K06+, T2A_U04+, T2A_U07+, T2A_U09+, T2A_U10+, T2A_W01+, T2A_W02+,
Codes of learning outcomes in a major area of study:	K2_K01+, K2_K03+, K2_U05+, K2_U07+, K2_U13+, K2_W03+, K2_W04+,

### LEARNING OUTCOMES:

#### Knowledge

W1 - A student will have knowledge of the application of technological strategies compatible with the concept of sustainable development, e.i. production of biodegradable polymers as packaging materials. He will describe methods of remediation and bioremediation that are used for a treatment of chemically degraded soils  
W2 - He will have knowledge of the sorbents and biosorbents used for wastewater treatment

#### Skills

U1 - A student will be able to perform bath culture of activated sludge for polyhydroxyalkanoates production. He will be able to determine kinetics constants and the rates of substrate consumption and PHA accumulation as well as PHA yield coefficient and volumetric productivity  
U2 - The student will be able to conduct a washing process for soils contaminated with heavy metals using biosurfactants in batch experiments. He will be able to determine kinetics constants and the efficiency of metal removal. The student will be able to determine the efficiency of PAHs removal from soils using biosurfactants in different operational conditions  
U3 - He will also be able to determine the degree of biosurfactants sorption onto soil. He will be able to determine the adsorption capacity of biosorbents and evaluate their efficiency of dye removal from aqueous solutions. He will be able to fit adsorption isotherm models and determine adsorption constants

#### Social competence

K1 - A student will be able to cowork in a group  
K2 - He will understand the importance of biotechnology methods in protection and restoration of the environment

### BASIC LITERATURE

1) Chen G.Q., Plastics from Bacteria. Natural Functions and Applications., wyd. Springer-Verlag, Berlin Heidelberg, Germany, 2010 ; 2) Khan F.I., Husain T., Hejazi R., An overview and analysis of site remediation technologies, wyd. Journal of Environmental Management, 2004, t. 71, s. 95-122; 3) Mulligan C.N., Environmental applications for biosurfactants, wyd. Environmental Pollution, 2005, t. 133, s. 183-198; 4) Gupta V.K., Suhas., Application of low-biosorbents for dye removal – a review, wyd. Journal of Environmental Management, 2009, t. 90, s. 2313–2342

### SUPPLEMENTARY LITERATURE

#### Course / module

Biotechnology in environmental protection

#### Fields of education:

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:**

**Field of study:** Environmental Engineering

**Specialty area:**

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/  
masters

**Year/Semester:** 1 / 1

#### Type of course:

Laboratory classes, Lecture

**Number of hours per semester/week:** Laboratory classes: 34, Lecture: 11

#### Teaching forms and methods

Laboratory classes(K1, U1, U2, U3) ; ,  
Lecture(K2, W1, W2) :

#### Form and terms of the verification results:

LABORATORY CLASSES: Write-up - null(K1, U1, U2, U3) ;LECTURE: Written exam - null(K2, W1, W2)

**Number of ECTS points:** 3,5

**Language of instruction** angielski

#### Introductory courses:

#### Preliminary requirements:

#### Name of the organizational unit offering the course:

Katedra Biotechnologii w Ochronie Środowiska,

#### Person in charge of the course:

dr hab. inż. Tomasz Pokój,

#### Course coordinators:

dr hab. inż. Tomasz Pokój, , dr inż. Katarzyna Bułkowska, , dr hab. inż. Zygmunt Gusiatin, , Temesgen Sibhatu Habtu,

#### Notes:

brak

## Detailed description of the awarded ECTS points - part B

**ECTS:3,5**  
**YEAR: 2018L**

### **BIOTECHNOLOGY IN ENVIRONMENTAL PROTECTION** **BIOTECHNOLOGY IN ENVIRONMENTAL PROTECTION**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: laboratory classes	34 h
- participation in: lecture	11 h
- consultation	4 h
	49 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 49 h : 1 h/ECTS = 49,00 ECTS  
average: **3,5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	49,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-45,50 ECTS points,



ECTS: 2  
YEAR: 2018L

**DESIGN OF PROCESSES IN ENVIRONMENTAL BIOTECHNOLOGY**  
**DESIGN OF PROCESSES IN ENVIRONMENTAL BIOTECHNOLOGY**

**COURSE CONTENT**  
**CLASSES:**

**LECTURES:**

**EDUCATIONAL OBJECTIVE:**

**DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR LEARNING OUTCOMES**

Codes of learning outcomes in a major field of study: T2A\_K02+, T2A\_K03+, T2A\_K04+, T2A\_K06+, T2A\_U09+, T2A\_U10+, T2A\_W02+,

Codes of learning outcomes in a major area of study: K2\_K01+, K2\_U07+, K2\_W04+,

**LEARNING OUTCOMES:**

**Knowledge**

W1 - Students will be able to describe the technologies for sewage sludge composting. Students will be able to describe methods for biodiesel production. They will have knowledge of the anarobic digestion of wastewater. They will be able to describe the system for agricultural biogas production. They will have knowledge of soil bioremediation and factors affecting the process efficiency

**Skills**

U1 - Student will be able to calculate the amount of sewage sludge in WWTP and individual components in composting feedstock (sewage sludge, lignocellulosic materials). Student will be able to develop the technological concept for production of various types of biofuels. They will be able to calculate the size of equipment in the technological systems for biogas production. They will be able to calculate bioremediation requirements for treatment of soils contaminated with petroleum, depending on contamination level

**Social competence**

K1 - Students will gain experience on understanding the relationships between proper design of biotechnological processes and quality of the environment. Students will be aware of the importance of biotechnological methods in protection and restoration of the environment

**BASIC LITERATURE**

1) Deublein D., Steinhauser A., Biogas from Waste and Renewable Resources, wyd. Wiley-VCH verlag GmGH & Co. KGaA, Weinheim, 2011 ; 2) Zhang Y., Dubé M.A., McLean D.D., Kates M. , Process design and technological assessment, wyd. Bioresource Technology, 2003, t. 89(1), s. 1-16; 3) Crawford R.L., Crawford D.L., Bioremediation – principles and applications, wyd. Cambridge University Press, 1996

**SUPPLEMENTARY LITERATURE**

**Course / module**

Design of processes in environmental biotechnology

**Fields of education:**

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:**

**Field of study:** Environmental Engineering

**Specialty area:**

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/ masters

**Year/Semester:** 1 / 1

**Type of course:**

Project classes

**Number of hours per semester/week:** Project classes: 30

**Teaching forms and methods**

Project classes(K1, U1, W1) :

**Form and terms of the verification results:**

PROJECT CLASSES: Project - null(K1, U1, W1)

**Number of ECTS points:** 2

**Language of instruction** angielski

**Introductory courses:**

**Preliminary requirements:**

**Name of the organizational unit offering the course:**

Katedra Biotechnologii w Ochronie Środowiska,

**Person in charge of the course:**

dr inż. Katarzyna Bułkowska,

**Course coordinators:**

dr inż. Katarzyna Bułkowska, , dr hab. inż. Zygmunt Gusiatin, , dr hab. inż. Tomasz Pokój, , Mohammed Alhamarna,

**Notes:**

brak



## Detailed description of the awarded ECTS points - part B

**ECTS:2**  
**YEAR: 2018L**

### **DESIGN OF PROCESSES IN ENVIRONMENTAL BIOTECHNOLOGY** **DESIGN OF PROCESSES IN ENVIRONMENTAL BIOTECHNOLOGY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: project classes	30 h
- consultation	2 h
	32 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 32 h : 1 h/ECTS = 32,00 ECTS  
average: **2 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	32,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-30,00 ECTS points,



**ENGLISH TERMINOLOGY IN BIOTECHNOLOGY**

**ECTS: 1,5**  
**YEAR: 2018L**

**COURSE CONTENT**  
**CLASSES:**

**LECTURES:**

**EDUCATIONAL OBJECTIVE:**

**DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR LEARNING OUTCOMES**

Codes of learning outcomes in a major field of study: T2A\_K02+, T2A\_K03+, T2A\_K04+, T2A\_K06+, T2A\_U01+, T2A\_U10+, T2A\_W01+,

Codes of learning outcomes in a major area of study: K2\_K01+, K2\_U01+, K2\_W01+,

**LEARNING OUTCOMES:**

**Knowledge**

W1 - Knowledge of English subjects related to the field of undergraduate and a more detailed knowledge of issues related to the speciality number of Master

**Skills**

U1 - Mastering English-language vocabulary on the topic of the lectures

**Social competence**

K1 - Improving the practical use of research of scientific literature in learning the English language in scientific discussion

**BASIC LITERATURE**

1) Łuczynski M. , English Terminology in Biotechnology. Bilingual (in English with English-Polish dictionary for each topic) materials for internal use at the Department of Environmental Biotechnology, wyd. Skryp autorski, 2016

**SUPPLEMENTARY LITERATURE**

**Course / module**

English terminology in biotechnology

**Fields of education:**

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:**

**Field of study:** Environmental Engineering

**Specialty area:**

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/ masters

**Year/Semester:** 1 / 1

**Type of course:**

Auditorium classes

**Number of hours per semester/week:** Auditorium classes: 30

**Teaching forms and methods**

Auditorium classes(K1, U1, W1) :

**Form and terms of the verification results:**

AUDITORIUM CLASSES: Colloquium test - null(K1, U1, W1)

**Number of ECTS points:** 1,5

**Language of instruction** angielski

**Introductory courses:**

**Preliminary requirements:**

**Name of the organizational unit offering the course:**

Katedra Biotechnologii w Ochronie Środowiska,

**Person in charge of the course:**

prof. dr hab. inż. Irena Wojnowska-Baryła,

**Course coordinators:**

dr inż. Dariusz Kaczmarczyk, , dr hab. inż. Zygmunt Gusiatiń, , Temesgen Sibhatu Habtu,

**Notes:**

brak

## Detailed description of the awarded ECTS points - part B

**ECTS:1,5**  
**YEAR: 2018L**

### ENGLISH TERMINOLOGY IN BIOTECHNOLOGY

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: auditorium classes	30 h
- consultation	2 h
	32 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 32 h : 1 h/ECTS = 32,00 ECTS  
average: **1,5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	32,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-30,50 ECTS points,



## ENGLISH/POLISH LANGUAGE SUPPORT

09149-25-C

ECTS: 1,5

YEAR: 2018L

## COURSE CONTENT

## CLASSES:

Teaching contents in accordance with the English language curriculum for the first semester of the B2 + level, according to the table of requirements of the European System of Language Description (CEFR), in cycle 1 x 30 h = 30 h; analysis and work with specialist texts in English in the field of water and wastewater management, waste management, ecological energy infrastructure, resource management and counteracting environmental threats, adaptation of companies and technologies to environmental requirements; translation of texts and articles in the field of environmental engineering from Polish into English and from English into Polish

## LECTURES:

not applicable

## EDUCATIONAL OBJECTIVE:

Developing language competences that allow students to understand, translate and use English specialist linguistics in the field of environmental engineering

## DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study: T2A\_K01+, T2A\_U03+, T2A\_U04+, T2A\_U06++, T2A\_W05+,

Codes of learning outcomes in a major area of study: K2\_K03+, K2\_U04+, K2\_U16+, K2\_W17+,

## LEARNING OUTCOMES:

## Knowledge

W1 - The student has the knowledge necessary to understand and formulate statements in English, containing specialist vocabulary in the field of a given field of study, according to the table of requirements for the B2 + CEFR level and in proportion to the number of hours planned.

## Skills

U1 - The student uses specialist terminology in the field of study, in proportion to the number of hours planned

U2 - The student reads with understanding and critically analyzes texts containing specialized lexicon in the field of study

## Social competence

K1 - The student understands the importance of foreign language skills, including English as one of the conference languages; appreciates the importance of foreign language skills as an element allowing for a better position in the conditions of growing competition on the labor market.

## BASIC LITERATURE

1) Richard Lee, English for Environmental Science, wyd. Garnet Education, 2009 ; 2) Keith Kelly, Science, wyd. Macmillan, 2008 ; 3) Keith Kelly, Geography, wyd. Macmillan, 2009

## SUPPLEMENTARY LITERATURE

## Course / module

English/Polish language support

## Fields of education:

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:** 09149-25-C

**Field of study:** Environmental Engineering

## Specialty area:

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/  
masters

**Year/Semester:** 1 / 1

## Type of course:

Classes

**Number of hours per semester/week:** Classes: 30

## Teaching forms and methods

Classes(K1, U1, U2, W1) : Communicative method with elements of the grammatical-translation method

## Form and terms of the verification results:

CLASSES: Evaluation of the work and cooperation in the group - The student is assessed on a scale of 2-5 for activity, creativity and correctness of tasks in the group.(K1, U1, U2, W1) ;CLASSES: Written test - Conducting at least two written tests consisting in solving by the student the tasks checking the degree of mastery of the lexical and grammatical material on a scale of 2-5(K1, U1, U2, W1)

**Number of ECTS points:** 1,5

**Language of instruction:** angielski

## Introductory courses:

none

## Preliminary requirements:

declared knowledge of English at B2 level

## Name of the organizational unit offering the course:

Zespół Języka Angielskiego,

## Person in charge of the course:

mgr Anna Żebrowska,

## Course coordinators:

dr Robert Lee,

## Notes:

brak

## Detailed description of the awarded ECTS points - part B

**09149-25-C**  
**ECTS:1,5**  
**YEAR: 2018L**

### ENGLISH/POLISH LANGUAGE SUPPORT

The awarded number of ECTS points is composed of:

#### 1. Contact hours with the academic teacher:

- participation in: classes	30 h
- consultation	2 h
	32 h

#### 2. Student's independent work:

- preparation for tests	10 h
- preparing for tutorials, doing housework and presentations	11 h
	21 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 53 h : 1 h/ECTS = 53,00 ECTS  
average: **1,5 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	32,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-30,50 ECTS points,



ECTS: 2  
YEAR: 2018L

**COURSE CONTENT  
CLASSES:**

**LECTURES:**

**EDUCATIONAL OBJECTIVE:**

**DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR  
LEARNING OUTCOMES**

Codes of learning outcomes in a major field of study: T2A\_K06+, T2A\_U07++, T2A\_W01+,

Codes of learning outcomes in a major area of study: K2\_K01+, K2\_U05++, K2\_W01+,

**LEARNING OUTCOMES:**

**Knowledge**

W1 - The Student knows and describes statistical approaches to specific environmental problems, knows a role statistics play in environmental science

**Skills**

U1 - The Student collects data and uses sampling and experimental design

U2 - The student interprets results from approaches used in monitoring, impact assessment, and risk assessment procedures

**Social competence**

K1 - Student demonstrates an active attitude with respect to the local and global environmental problems. Students update their knowledge of key topics related to environmental sciences

**BASIC LITERATURE**

1) Walker C. H., Hopkin S. P., Sibly R. M., Peakall B., Principles of Ecotoxicology, Third Edition, wyd. CRC Press., 2005 ; 2) Manly, B.F. J., Statistics for environmental science and management. 2nd ed., wyd. Chapman and Hall/CRC , 2010

**SUPPLEMENTARY LITERATURE**

**Course / module**

Environmental statistics

**Fields of education:**

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:**

**Field of study:** Environmental Engineering

**Specialty area:**

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/  
masters

**Year/Semester:** 1 / 1

**Type of course:**

Auditorium classes

**Number of hours per semester/week:** Auditorium classes:  
30

**Teaching forms and methods**

Auditorium classes(K1, U1, U2, W1) :

**Form and terms of the verification results:**

AUDITORIUM CLASSES: Colloquium test - null(K1, U1, U2, W1)

**Number of ECTS points:** 2

**Language of instruction** angielski

**Introductory courses:**

**Preliminary requirements:**

**Name of the organizational unit offering the course:**

Katedra Biotechnologii w Ochronie Środowiska,

**Person in charge of the course:**

prof. dr hab. Paweł Brzuzan,

**Course coordinators:**

prof. dr hab. Paweł Brzuzan,

**Notes:**

brak

## Detailed description of the awarded ECTS points - part B

**ECTS:2**  
**YEAR: 2018L**

### ENVIRONMENTAL STATISTICS

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: auditorium classes	30 h
- consultation	2 h
	32 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 32 h : 1 h/ECTS = 32,00 ECTS  
average: **2 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	32,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-30,00 ECTS points,



09149-25-C

ECTS: 1

YEAR: 2018L

**GERMAN LANGUAGE  
GERMAN LANGUAGE****COURSE CONTENT****CLASSES:**

Teaching contents in accordance with the German language curriculum for the first semester of the B2 + level, according to the table of requirements of the European System of Language Description (CEFR), in cycle 1 x 30 h = 30 h; analysis and work with specialist texts in German in the field of water and wastewater management, waste management, ecological energy infrastructure, resource management and counteracting environmental threats, adaptation of companies and technologies to environmental requirements; translation of texts and articles in the field of environmental engineering from Polish into German and from German into Polish

**LECTURES:**

not applicable

**EDUCATIONAL OBJECTIVE:**

Developing language competences that allow students to understand, translate and use German specialist linguistics in the field of environmental engineering

**DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN RELATION TO FIELD AND MAJOR LEARNING OUTCOMES**

Codes of learning outcomes in a major field of study: T2A\_K01+, T2A\_U03+, T2A\_U04+, T2A\_U06++, T2A\_W05+,

Codes of learning outcomes in a major area of study: K2\_K03+, K2\_U04+, K2\_U16+, K2\_W17+,

**LEARNING OUTCOMES:****Knowledge**

W1 - The student has the knowledge necessary to understand and formulate statements in German, containing specialist vocabulary in the field of a given field of study, according to the table of requirements for the B2 + CEFR level and in proportion to the number of hours planned.

**Skills**

U1 - The student uses specialist terminology in the field of study, in proportion to the number of hours planned

U2 - The student reads with understanding and critically analyzes texts containing specialized lexicon in the field of study

**Social competence**

K1 - The student understands the importance of foreign language skills, including German as one of the conference languages; appreciates the importance of foreign language skills as an element allowing for a better position in the conditions of growing competition on the labor market.

**BASIC LITERATURE**

1) Wolfhart Duerschmitt, Dieter Boehme, Elke Hammer, Erneuerbare Energien, wyd. BMU, 2011

**SUPPLEMENTARY LITERATURE****Course / module**

German Language

**Fields of education:**

Obszar nauk technicznych

**Course status:** facultative**Course group:** brak**ECTS code:** 09149-25-C**Field of study:** Environmental Engineering**Specialty area:****Educational profile:** General academic**Form of study:** Stacjonarne**Level of study:** Drugiego stopnia/  
masters**Year/Semester:** 1 / 1**Type of course:**

Classes

**Number of hours per semester/week:** Classes: 30**Teaching forms and methods**

Classes(K1, U1, U2, W1) : Communicative method with elements of the grammatical-translation method

**Form and terms of the verification results:**

CLASSES: Evaluation of the work and cooperation in the group - The student is assessed on a scale of 2-5 for activity, creativity and correctness of tasks in the group.(K1, U1, U2, W1) ;CLASSES: Written test - Conducting at least two written tests consisting in solving by the student the tasks checking the degree of mastery of the lexical and grammatical material on a scale of 2-5(K1, U1, U2, W1)

**Number of ECTS points:** 1**Language of instruction** angielski**Introductory courses:**

none

**Preliminary requirements:**

declared knowledge of German at B2 level

**Name of the organizational unit offering the course:**

Zespół Języka Angielskiego,

**Person in charge of the course:**

mgr Anna Żebrowska,

**Course coordinators:****Notes:**

brak



## Detailed description of the awarded ECTS points - part B

**09149-25-C**  
**ECTS:1**  
**YEAR: 2018L**

### **GERMAN LANGUAGE** **GERMAN LANGUAGE**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: classes	30 h
- consultation	2 h
	32 h

2. Student's independent work:

- preparation for tests	10 h
- preparing for tutorials, doing housework and presentations	11 h
	21 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 53 h : 1 h/ECTS = 53,00 ECTS  
average: **1 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	32,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-31,00 ECTS points,



ECTS: 1  
YEAR: 2018L

## MONITORING OF AEROBIC STABILIZATION OF MUNICIPAL SOLID WASTE MONITORING OF AEROBIC STABILIZATION OF MUNICIPAL SOLID WASTE

### COURSE CONTENT CLASSES:

### LECTURES:

### EDUCATIONAL OBJECTIVE:

### DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study: T2A\_K02+, T2A\_K03+, T2A\_K04+, T2A\_K06+, T2A\_U02+, T2A\_U05+, T2A\_U09+, T2A\_W02+,

Codes of learning outcomes in a major area of study: K2\_K01+, K2\_U02+, K2\_U09+, K2\_W06+,

### LEARNING OUTCOMES:

#### Knowledge

W1 - The student learns the basic technological aspects of the process of stabilizing waste in conditions aerobic, tendencies of changes in physicochemical parameters during the process, including their dependence on the degree stability of waste. After completing the course, the student should have basic knowledge in the field of optimization the process of stabilizing municipal waste on a technical scale, based on the analysis of basic criteria stability, such as AT4 - four-day respirometric activity or LOI - loss on ignition

#### Skills

U1 - During the course of classes, the student acquires the ability to assess the effectiveness of the technological process based on the biological treatment of municipal waste under aerobic conditions

U2 - The student masters the basics of laboratory techniques in the analysis of conditions taking place inside oxygen reactor to stabilize waste

#### Social competence

K1 - The program of classes has been prepared in such a way as to provide students with competences to work in factories processing of municipal and organic waste, having in its technological equipment composting of municipal waste, sewage sludge or green waste. Knowledge acquired Technological also gives the basics from mastering the technology of bio-waste in the aspect of fuel production alternative

### BASIC LITERATURE

1) Roger Tim Haug, The Practical Handbook of Compost Engineering, wyd. CRC Press, 1993 ; 2) Alessandro Chiumenti, Modern composting technologies, wyd. JG Press, 2005 ; 3) T. V. Ramachandra, Management of Municipal Solid Waste, wyd. TERI Press, 2006 ; 4) L.F. Diaz, M. de Bertoldi, W. Bidlingmaier, Compost Science and Technology, wyd. Elsevier, 2011 ; 5) Heribert Insam, Nuntavun Riddech, Susanne Klammer, Microbiology of Composting, wyd. Springer, 2002, t. 14

### SUPPLEMENTARY LITERATURE

#### Course / module

Monitoring of aerobic stabilization of municipal solid waste

#### Fields of education:

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:**

**Field of study:** Environmental Engineering

#### Specialty area:

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/ masters

**Year/Semester:** 1 / 1

#### Type of course:

Laboratory classes

**Number of hours per semester/week:** Laboratory classes: 15

#### Teaching forms and methods

Laboratory classes(K1, U1, U2, W1) :

#### Form and terms of the verification results:

LABORATORY CLASSES: Report - null(W1) ;LABORATORY CLASSES: Write-up - null(K1, U1, U2)

**Number of ECTS points:** 1

**Language of instruction** angielski

#### Introductory courses:

#### Preliminary requirements:

#### Name of the organizational unit offering the course:

Katedra Biotechnologii w Ochronie Środowiska,

#### Person in charge of the course:

dr inż. Sławomir Kasiński,

#### Course coordinators:

dr inż. Sławomir Kasiński, , Mohammed Alhamarna,

#### Notes:

brak

## Detailed description of the awarded ECTS points - part B

**ECTS:1**  
**YEAR: 2018L**

### **MONITORING OF AEROBIC STABILIZATION OF MUNICIPAL SOLID WASTE** **MONITORING OF AEROBIC STABILIZATION OF MUNICIPAL SOLID WASTE**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: laboratory classes	15 h
- consultation	2 h
	17 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 17 h : 1 h/ECTS = 17,00 ECTS  
average: **1 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	17,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-16,00 ECTS points,



**TECHNIQUES OF GENETIC ENGINEERING**

**ECTS: 3**  
**YEAR: 2018L**

**COURSE CONTENT**  
**CLASSES:**

**LECTURES:**

**EDUCATIONAL OBJECTIVE:**

**DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR LEARNING OUTCOMES**

Codes of learning outcomes in a major field of study: T2A\_K02+, T2A\_K03+, T2A\_K04+, T2A\_K05+, T2A\_K06+, T2A\_K07+, T2A\_U01+, T2A\_U10++, T2A\_U17+, T2A\_U19+, T2A\_W06++,

Codes of learning outcomes in a major area of study: K2\_K01+, K2\_K02+, K2\_U01+, K2\_U14+, K2\_W10++,

**LEARNING OUTCOMES:**

**Knowledge**

W1 - Student will have knowledge concerning methods of analysis and recombination of DNA  
W2 - Student will know molecular methods useful for the study of microbial diversity and activity

**Skills**

U1 - Student should acquire skills of DNA analysis, especially electrophoretic methods of DNA examination, gene fragments amplification using Polymerase Chain Reaction  
U2 - Student should acquire ability to microbial diversity and genetic distance estimation on the base of DN fingerprints

**Social competence**

K1 - Student will understand the potential risk of Genetically Modified Organisms application  
K2 - Student should be aware of responsibility of Genetic Modified Organisms spread in environment

**BASIC LITERATURE**

1) Glick B. R., Pasternak J. J., Patten C. L., Molecular Biotechnology. Principles and applications of recombinant DNA. , wyd. ASM Press, 2010

**SUPPLEMENTARY LITERATURE**

**Course / module**

Techniques of genetic engineering

**Fields of education:**

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:**

**Field of study:** Environmental Engineering

**Specialty area:**

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/ masters

**Year/Semester:** 1 / 1

**Type of course:**

Laboratory classes, Lecture

**Number of hours per semester/week:** Laboratory classes: 24, Lecture: 6

**Teaching forms and methods**

Laboratory classes(K1, K2, U1, U2) ; , Lecture(W1, W2) :

**Form and terms of the verification results:**

LABORATORY CLASSES: Report - null(K1, K2, U1, U2) ;LECTURE: Written exam - null(U1, W1, W2)

**Number of ECTS points:** 3

**Language of instruction** angielski

**Introductory courses:**

**Preliminary requirements:**

**Name of the organizational unit offering the course:**

Katedra Biotechnologii w Ochronie Środowiska,

**Person in charge of the course:**

dr hab. Sławomir Ciesielski, prof. UWM

**Course coordinators:**

dr hab. Sławomir Ciesielski, prof. UWM, dr inż. Dariusz Kaczmarczyk, , Mohammed Alhamarna,

**Notes:**

brak

## Detailed description of the awarded ECTS points - part B

**ECTS:3**  
**YEAR: 2018L**

### TECHNIQUES OF GENETIC ENGINEERING

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: laboratory classes	24 h
- participation in: lecture	6 h
- consultation	4 h
	34 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 34 h : 1 h/ECTS = 34,00 ECTS  
average: **3 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	34,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-31,00 ECTS points,



**ECTS: 3**  
**YEAR: 2018L**

**TOXICOLOGY**  
**TOXICOLOGY**

**COURSE CONTENT**  
**CLASSES:**

**LECTURES:**

**EDUCATIONAL OBJECTIVE:**

**DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR LEARNING OUTCOMES**

Codes of learning outcomes in a major field of study: T2A\_K01+, T2A\_K02+, T2A\_K03+, T2A\_K04+, T2A\_K06+, T2A\_U01+, T2A\_U03+, T2A\_U04+, T2A\_U08++, T2A\_U10+, T2A\_W01+,

Codes of learning outcomes in a major area of study: K2\_K01+, K2\_K03+, K2\_U01+, K2\_U03+, K2\_U06++, K2\_W02+,

**LEARNING OUTCOMES:**

**Knowledge**

W1 - Student describes the selected pollutants and explains their toxic effects at different levels of biological organization

**Skills**

U1 - Student classifies different responses of organisms and formulates simple hypotheses concerning the toxicity of selected contaminants

U2 - The student interprets the results obtained from the experiments carried out by the use of gained knowledge of the natural sciences and engineering

U3 - The student has the skills to operate basic equipment of the molecular biology lab

**Social competence**

K1 - Student demonstrates an active attitude with respect to the local and global environmental problems. The student cooperates with other students in a scientific experiment

K2 - Students update their knowledge from ecotoxicology and molecular toxicology and knows its practical application in environmental monitoring

**BASIC LITERATURE**

1) Brown T.A, Genomes 3, wyd. Garland Science Publishing, 2007 ; 2) Brzuzan P., Woźny M., Toxicology. Student's coursebook. Department of Environmental Biotechnology, wyd. d. University of Warmia and Mazury in Olsztyn, Poland, 2012 ; 3) Penningroth, S., Essentials of Toxic Chemical Risk Science and Society, wyd. CRC Press, London, 2010 ; 4) Walker C. H., Hopkin S. P., Sibly R. M., Peakall B., Principles of Ecotoxicology, Third Edition., wyd. wyd. CRC Press, 2005 ; 5) McCarthy J.F., Shugart L.R., Biomarkers of environmental contamination., wyd. Lewis Publishers, 1990

**SUPPLEMENTARY LITERATURE**

**Course / module**

Toxicology

**Fields of education:**

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:**

**Field of study:** Environmental Engineering

**Specialty area:**

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/ masters

**Year/Semester:** 1 / 1

**Type of course:**

Laboratory classes, Lecture

**Number of hours per semester/week:** Laboratory classes: 25, Lecture: 5

**Teaching forms and methods**

Laboratory classes(K1, K2, U3, W1) ; , Lecture(K2, U1, U2, W1) :

**Form and terms of the verification results:**

LABORATORY CLASSES: Report - null(K1, K2, U3, W1) ;LECTURE: Written exam - null(K2, U1, U2, W1)

**Number of ECTS points:** 3

**Language of instruction** angielski

**Introductory courses:**

**Preliminary requirements:**

**Name of the organizational unit offering the course:**

Katedra Biotechnologii w Ochronie Środowiska,

**Person in charge of the course:**

prof. dr hab. Paweł Brzuzan,

**Course coordinators:**

dr inż. Maciej Woźny, , Mohammed Alhamarna, , Temesgen Sibhatu Habtu,

**Notes:**

brak

## Detailed description of the awarded ECTS points - part B

**ECTS:3**  
**YEAR: 2018L**

### **TOXICOLOGY** **TOXICOLOGY**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: laboratory classes	25 h
- participation in: lecture	5 h
- consultation	4 h
	34 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 34 h : 1 h/ECTS = 34,00 ECTS  
average: **3 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	34,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-31,00 ECTS points,



**ECTS: 4**  
**YEAR: 2018L**

## WATER AND WASTEWATER TREATMENT WATER AND WASTEWATER TREATMENT

### COURSE CONTENT CLASSES:

### LECTURES:

### EDUCATIONAL OBJECTIVE:

### DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR LEARNING OUTCOMES

Codes of learning outcomes in a major field of study: T2A\_K01+, T2A\_K02+, T2A\_K03+, T2A\_K04+, T2A\_K06+, T2A\_U03+, T2A\_U04++, T2A\_U07+, T2A\_U09+, T2A\_W03+,

Codes of learning outcomes in a major area of study: K2\_K01+, K2\_K03+, K2\_U03+, K2\_U05+, K2\_U09+, K2\_U13+, K2\_W09+,

### LEARNING OUTCOMES:

#### Knowledge

W1 - Characterizes and knows the selected unit processes, technological solutions and mechanisms used in water, wastewater and sludge treatment. Defines technological parameters of water and wastewater treatment. Defines the types of biomass in wastewater treatment systems and recognizes the relationships between technological parameters of wastewater treatment and the structure of microbial consortia in activated sludge. Characterizes the composition of extracellular polymers and defines their role in the formation of complex microbial structures. Understands the role of extracellular enzymes in biological treatment. Characterizes groups of nitrogen-converting microorganisms in wastewater treatment systems. Lists the molecular biology techniques used to evaluate the abundance and diversity of microorganisms in wastewater treatment systems, including emerging technologies. Recognizes the possibilities of use of solar energy and the energy coming from anaerobic digestion of sewage sludge for

#### Skills

U1 - Analyzes the selected unit processes used in water and wastewater treatment, understands their role in the technologies used in environmental protection. Determines experimentally the operational parameters of water and wastewater treatment. Determines the effectiveness of wastewater treatment by activated sludge method, depending on the composition of wastewater

U2 - Calculates the nitrogen balance in wastewater treatment systems. Calculates the amount and the volume of sewage sludge produced in biological systems. Can determine biogas productivity during anaerobic processes

U3 - Knows how to interpret the relationships between the molecular and technological results. Knows how to characterize biomass in wastewater treatment systems. Knows how to apply techniques of molecular biology in order to obtain information about the microorganisms that inhabit wastewater treatment systems

U4 - Can write a report from the conducted experiments

#### Social competence

K1 - Is aware of the importance of technologies to prevent environmental degradation. Is able to work in the team  
K2 - Is aware of the need for learning throughout life

### BASIC LITERATURE

1) Snyder L., Champness W., Molecular Genetics of Bacteria, wyd. ASM Press, 2007 ; 2) Wojnowska-Baryła I., Cydzik-Kwiatkowska A., Zielińska M., The application of molecular techniques to the study of wastewater treatment systems, Methods in molecular biology, wyd. Clifton, N.J., 2010, t. 599, s. 157-183; 3) different authors, Materials and laboratory protocols given by a teacher, wyd. author's script, 2018 ; 4) Spiro T.G., Stigliani W.M., Chemistry of the Environment, 2nd Edition, wyd. Prentice Hall, 2002

### SUPPLEMENTARY LITERATURE

#### Course / module

Water and wastewater treatment

#### Fields of education:

Obszar nauk technicznych

**Course status:** facultative

**Course group:** brak

**ECTS code:**

**Field of study:** Environmental Engineering

**Specialty area:**

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/  
masters

**Year/Semester:** 1 / 1

#### Type of course:

Laboratory classes, Auditorium classes

**Number of hours per semester/week:** Laboratory classes: 56, Auditorium classes: 19

#### Teaching forms and methods

Laboratory classes(K1, U1, U2, U3) ; , Auditorium classes(K2, U4, W1) :

#### Form and terms of the verification results:

LABORATORY CLASSES: Report - null(K1, K2, U4) ; AUDITORIUM CLASSES: Colloquium test - null(U1, U2, U3, W1)

**Number of ECTS points:** 4

**Language of instruction:** angielski

#### Introductory courses:

#### Preliminary requirements:

#### Name of the organizational unit offering the course:

Katedra Biotechnologii w Ochronie Środowiska,

#### Person in charge of the course:

dr hab. Magdalena Zielińska,

#### Course coordinators:

dr hab. Magdalena Zielińska, , dr hab. inż. Agnieszka Cydzik-Kwiatkowska, , Temesgen Sibhatu Habtu, , Mohammed Alhamarna, , dr hab. inż. Katarzyna Bernat,

#### Notes:

up to 18 students



## Detailed description of the awarded ECTS points - part B

**ECTS:4**  
**YEAR: 2018L**

### **WATER AND WASTEWATER TREATMENT** **WATER AND WASTEWATER TREATMENT**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: auditorium classes	19 h
- participation in: laboratory classes	56 h
- consultation	2 h
	77 h

2. Student's independent work:

0 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 77 h : 1 h/ECTS = 77,00 ECTS  
average: **4 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	77,00 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	-73,00 ECTS points,

**WRITING SCIENTIFIC PAPERS  
WRITING SCIENTIFIC PAPERS****06049-24-C****ECTS: 2****YEAR: 2018L****COURSE CONTENT****CLASSES:**

1. Variety of publications, 2. Planning, 3. Organising the paper, 4. Dealing with copyright, 5. Outlining the paper, 6. Writing the first draft, 7. Writing the Abstract and Introduction, 8. Writing the Results section, 9. How to write the Discussions, 10. Impact Factor (IF) and Hirsch Index (HI) (h-index), 11. Diagrams, 12. Photomicrographs, 13. Charts and tables, 14. Slides, 15. Posters

**LECTURES:**

How to read, write, present and publish scientific papers

**EDUCATIONAL OBJECTIVE:**

HOW TO WRITE SCIENCE WORKS

**DESCRIPTION OF LEARNING OUTCOMES FOR THE COURSE IN REALATION TO FIELD AND MAJOR****LEARNING OUTCOMES**

Codes of learning outcomes in a major field of study: T2A\_K01+, T2A\_K02+, T2A\_K03+, T2A\_K04+, T2A\_K06+, T2A\_U03++, T2A\_U04++, T2A\_U06++, T2A\_W01+, T2A\_W05+, T2A\_W10+,

Codes of learning outcomes in a major area of study: K2\_K01+, K2\_K03+, K2\_U04++, K2\_W01+, K2\_W15+, K2\_W17+,

**LEARNING OUTCOMES:****Knowledge**

W1 - Knowledge of the principles of the preparation, presentation and writing scientific publications  
W2 - Knowledge of speciality

**Skills**

U1 - Presentation (oral and written) in English rules of writing, publishing and presenting scientific papers.  
U2 - Practical rules of writing and presenting scientific papers (publication, poster, presentation)

**Social competence**

K1 - Creativity in scientific work; proactive in expressing evaluations; willingness to cooperate in a team; aware of the continuous growth of knowledge and progress methodically  
K2 - Orientation for their own intellectual development; proceedings in accordance with the rules of ethics

**BASIC LITERATURE**

1) Łuczynski M., Writing Scientific Papers. Materials for internal use at the Department of Environmental Biotechnology., wyd. Skrypt autorski, 2016

**SUPPLEMENTARY LITERATURE****Course / module**

Writing scientific papers

**Fields of education:**

Obszar nauk technicznych

**Course status:** facultative

**Course group:** C - przedmioty specjalnościowe

**ECTS code:** 06049-24-C

**Field of study:** Environmental Engineering

**Specialty area:** Environmental Biotechnology

**Educational profile:** General academic

**Form of study:** Stacjonarne

**Level of study:** Drugiego stopnia/  
masters

**Year/Semester:** 1 / 1

**Type of course:**

Lecture, Auditorium classes

**Number of hours per semester/week:** Lecture: 15,  
Auditorium classes: 15

**Teaching forms and methods**

Lecture(W1, W2) : Lecture information lecture , Auditorium classes(K1, K2, U1, U2) : classes: panel discussion

**Form and terms of the verification results:**

LECTURE: Colloquium test - test(K1, K2, U1, U2, W1, W2) ;AUDITORIUM CLASSES: Colloquium test - test(K1, K2, U1, U2, W1, W2)

**Number of ECTS points:** 2

**Language of instruction** polski

**Introductory courses:**

none

**Preliminary requirements:**

none

**Name of the organizational unit offering the course:**

**Person in charge of the course:**

**Course coordinators:**

dr hab. inż. Agnieszka Cydzik-Kwiatkowska,

**Notes:**

brak

## Detailed description of the awarded ECTS points - part B

**06049-24-C**  
**ECTS:2**  
**YEAR: 2018L**

### **WRITING SCIENTIFIC PAPERS** **WRITING SCIENTIFIC PAPERS**

The awarded number of ECTS points is composed of:

1. Contact hours with the academic teacher:

- participation in: auditorium classes	15 h
- participation in: lecture	15 h
- consultation	2 h
	32 h

2. Student's independent work:

- preparation for completing the course	18 h
	18 h

1 ECTS point = 25-30 h. of the average student's work, number of ECTS points = 50 h : 25 h/ECTS = 2,00 ECTS  
average: **2 ECTS**

- including the number of ECTS points for contact hours with direct participation of the academic teacher:	1,28 ECTS points,
- including the number of ECTS points for hours completed in the form of the student's independent work:	0,72 ECTS points,