Attachment No. 5 to Rector's ordinance No. 22/2020

DESCRIPTION OF THE COURSE OF STUDY

Course code	**0511-2BIO-BC05-H**	
Name of the course in	Polish	**Hydrobiologia**
	English	**Hydrobiology**

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	Biology
1.2. Mode of study	stationary
1.3. Level of study	second-degree studies
1.4. Profile of study*	general academic
1.5. Person/s preparing the course description	Joanna Czerwik-Marcinkowska
1.6. Contact	

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	English
2.2. Prerequisites*	Basic knowledge of the biology and ecology of aquatic organisms.

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes		lectures, classes, (including e-learning)
3.2. Place of classes		Institute of Biology
3.3. Form of assessment		examination / graded credit
3.4. Teaching methods		lectures, classes, multimedia presentation, discussion
3.5. Bibliography	**Required reading**	Kajak Z. Hydrobiologia – limnologia. Ekosystemy wód śródlądowych. Wyd. Nauk. PWN Warszawa, 2003. Lampert W., Sommer U. Ekologia wód śródlądowych. Wyd. Nauk. PWN Warszawa, 1996. Starmach K., Wróbel S., Pasternak K. Hydrobiologia. Limnologia. PWN Warszawa, 2005
	Further reading	Kawecka B., Eloranta R.V. Zarys ekologii glonów wód słodkich i środowisk lądowych. Wyd. Nauk. PWN Warszawa 2004; 1-180. Podbielkowski Z., Tomaszewicz H. Zarys hydrobotaniki. Wyd. Nauk PWN Warszawa 2004; 1-167. Turoboyski L. Hydrobiologia techniczna. PWN Warszawa 2001; 1-125.

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives ***(including form of classes)***

C1. *To acquaint students with the specifics of the aquatic environment and the conditions enabling the life of hydrobionts.*

C2. *The principles of functioning of aquatic ecosystems as well as ecological and evolutionary conditions of biodiversity in the aquatic environment.*

C3. *The modern theories and natural laws regarding the aquatic environment as well as ways to adapt aquatic plants and animals to the environments.*

C4. *The contemporary conditions and threats to biodiversity of aquatic environments.*

4.2. Detailed syllabus ***(including form of classes)***

Lectures

1. *Hydrobiology as a field of science. Historical development, basic elements of hydrobiological research. Dictionary of basic terms in the field of hydrobiology.*
2. *Living conditions of aquatic organisms. Water as an environment. Physical properties of water. Surface and underground water movement.*
3. *River. General characteristics: elements of the river valley, fluvial forms. Communities of flowing water organisms. Plants, animals, their groups, compounds, Adaptation to life in the current of water.*
4. *Lake. General characteristics: lake morphology, thermal lake characteristics, stratification and mix types. Stagnant water organisms communities. Food nets. Biomanipulation.*
5. *Ponds and specific water environments: groundwater, springs, estuaries.*
6. *Dam reservoirs. Functions and tasks. Tank types.*
7. *Communities of aquatic organisms.*
8. *Polluted waters. Types of pollution and their impact on the aquatic environment. Wastewater treatment.*

(including e-learning)

Classes

1. *Water as a living environment for organisms. Methodology of hydrobiological tests: taking samples for testing, testing: water, bottom sediments, aquatic organisms (plankton, benthos, nekton, periphyton).*
2. *Methodology of hydrobiological tests: examination of selected physical and chemical parameters of the flowing water environment (thermal and oxygen conditions, basic chemical composition of waters, biogenic compound).*
3. *Groups of flowing water organisms. Settled lower plants. Plankton (work with the microscope and magnifying glass). Higher aquatic plants – Botanical Garden.*
4. *Flowing water fauna. Impact of physical and chemical factors on the occurrence and distribution of aquatic animals. Aquatic invertebrates. Fishing and review of major representatives.*
5. *Groups of standing water organisms. Settled lower plants. Lake and pond plankton. Higher plants – ecological belts in the lake littoral.*
6. *Stagnant water fauna. Impact of physical and chemical factors on the occurrence and distribution of aquatic animals. Aquatic invertebrates. Fish fauna. Review of major species.*
7. *Acidotrophization of surface waters. Examination of water susceptibility to acidification. River restoration and lake remediation. Criteria for choosing the optimal method for a given watercourse or reservoir.*
8. *Eutrophication of waters. Causes, symptoms, prevention options.*

(including e-learning)

1. Fundamentals of microscopic technique, the principals of water sampling. Overview of methods for determination of quantitative and qualitative hydrobiological analysis.
2. The sampling and consequent analysis of samples of stagnant water.
3. The sampling and consequent analysis of samples of running water.
4. Monitoring of wastewater – analysis of activated sludge. Saprobity, saprobic index determination.

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of **KNOWLEDGE:**		
BIO2A_W01	The student knows and understands the principles of functioning of aquatic ecosystems as well as ecological and evolutionary conditions of biodiversity in the aquatic environment.	P7S_WG
BIO2A_W04	The student knows and understands at an advanced level modern theories and natural laws regarding the aquatic environment as well as ways to adapt aquatic plants and animals to the environments.	P7S_WG
within the scope of **ABILITIES:**		
BIO2A_U01	The student is able to document the results of completed research tasks, skilfully compare them with other sources and draw appropriate conclusions.	P7S_UW
BIO2A_U03	The student ia able to prepare a presentation of the results of his research compare them with results of other authors' research and lead a discussion as well as find and apply innovative solutions.	P7S_UW
within the scope of **SOCIAL COMPETENCE:**		
BIO2A_K01	The student is ready to critically assess the information used.	P7S_KK
BIO2A_K02	The student is ready to take responsibility for assessing the risks arising from the work of biologist and comply with the principles of health and safety in biological laboratories.	P7S_KO

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes *(code)*	Method of assessment (+/-)																					
	Exam oral/written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others* e.g. standardized test used in e-learning		
	Form of classes			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*			*Form of classes*		
	L	*C*	...	*L*	*C*	...	*L*	*C*	...	*L*	*C*	...	*L*	*C*	...	*L*	*C*	...	*L*	*C*	...
BIO2A_W01	+				+																
BIO2A_W04	+				+																
BIO2A_U01	+										+										
BIO2A_U03	+										+										
BIO2A_K01	+																+				

BIO2A_K02	+															+			

delete as appropriate

4.5. Criteria of assessment of the intended learning outcomes		
Form of classes	**Grade**	**Criterion of assessment**
lecture (L) (including e-learning)	**3**	L - obtaining 51%-65% of the total number of points
	3,5	L - obtaining 66%-75% of the total number of points
	4	L - obtaining 76%-85% of the total number of points
	4,5	L - obtaining 86%-95% of the total number of points
	5	L - obtaining 96%-100% of the total number of points
classes (C)* (including e-learning)	**3**	C - obtaining 51%-65% of the total number of points
	3,5	C - obtaining 66%-75% of the total number of points
	4	C - obtaining 76%-85% of the total number of points
	4,5	C - obtaining 86%-95% of the total number of points
	5	C - obtaining 96%-100% of the total number of points
others (...)* (including e-learning)	**3**	
	3,5	
	4	
	4,5	
	5	

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	**Student's workload**	
	Full-time studies	**Extramural studies**
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	**45**	
*Participation in lectures**	**15**	
*Participation in classes, seminars, laboratories**	**30**	
*Preparation in the exam/ final test**		
*Others (please specify e.g. e-learning)**		
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	**55**	
*Preparation for the lecture**	**10**	
*Preparation for the classes, seminars, laboratories**	**10**	
*Preparation for the exam/test**	**10**	
*Gathering materials for the project/Internet query**	**10**	
Preparation of multimedia presentation	**15**	
*Others **		
TOTAL NUMBER OF HOURS	**100**	
ECTS credits for the course of study	**4**	

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Accepted for execution *(date and legible signatures of the teachers running the course in the given academic year)*

Joanna Czerwik-Marcinkowska

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