Module syllabus: ***Selected topics in hydrobiology***

1. Overall information

Module coordinator	Iga Lewin Ph.D., D.Sc. (Department of Hydrobiology)
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ECTS	
Method for the of learning outcomes	The final grade for the module is weighted on the average of the following student activities: - Active participation in laboratory and field classes (continuous evaluation of practical skills, tests and reports) (0.7), - Written final exam (0.3). For a grade to be awarded, the student must have passed each activity of the module. Grades: below 51% – fail (F); 52-60% – with minimum academic criteria (E); 61-65% – satisfactory (D); 66-75% – good (C); 76-85% – very good (B), ≥ 85% – excellent (A)

2. Description of student activity and work

Lecture/discussion sessions	
Responsible instructor	Iga Lewin Ph.D., D.Sc. (Department of Hydrobiology)
Content	**The main objective of the module** is to acquaint students with the basic issues related to the characteristics of freshwater environments, the overall features of freshwater invertebrate communities and the importance of benthic macroinvertebrates in the assessment of the ecological status of rivers. **Lecture content:** Basic introduction to the principles underlying hydrobiology, the characteristic features of freshwater ecosystems, the physical and chemical properties of water, invertebrate communities and their role in freshwater ecosystems, adaptations of invertebrate organisms to live in freshwater environments, macrophytes and their adaptations to live in freshwater environments, anthropopressure and the anthropogenic reservoirs of Upper Silesia, the role of the aquatic environments of Upper Silesia in the conservation of biodiversity, the assessment of the ecological status of rivers based on benthic macroinvertebrates in accordance with the requirements of the Water Framework Directive of the European Union.
Number of didactic hours (contact hours)	**10**
Literature	1. Allan J. D., Castillo M. M. 2007. Stream ecology. Structure and function of running waters. Second edition. Springer, Dordrecht, the Netherlands. http://dx. doi.org/10.1007/978-1-4020-5583-6 2. Dodds W. K. 2002. Freshwater ecology. Concepts and environmental applications. Academic Press, USA.

Laboratory and field classes	
Responsible instructor	Iga Lewin Ph.D., D.Sc. (Department of Hydrobiology)
Laboratory and field projects	**Topic 1.** Freshwater as an environment for living organisms (laboratory class). **Topic 2.** The adaptations of hololimnic organisms to live in freshwater ecosystems (laboratory class). **Topic 3.** The adaptations of merolimnic organisms to live in freshwater ecosystems (laboratory class). **Topic 4.** Macrophytes in freshwater ecosystems (laboratory class). **Topics 5.** The role of the aquatic environments of Upper Silesia in the conservation of biodiversity (field classes). **Topic 6.** Benthic macroinvertebrates in the assessment of the ecological status of rivers in accordance with the requirements of the Water Framework Directive of the European Union (laboratory class). **Topic 7.** The practical application of the multimetric index MMI_PL in the assessment of the ecological status of rivers. Working with spreadsheets (laboratory class). Final exam: topics 1-7.
Methodology of laboratory and field classes	Laboratory and field work will be performed individually and in small groups under the supervision of the instructor and will include: • practical work with stereo microscopes, macroinvertebrates and macrophytes (identifying organisms); • measuring the physical and chemical parameters of the water (chemical regents and meters); • practical work with field equipment (oxygen concentration meter, pH/TDS/EC/temperature meters, D-frame net, dredge, core sampler); • calculating and elaborating on the results; • commitment to the protocols.
Number of didactic hours (contact hours)	**20**
Literature	1. Aqem Consortium 2002. Manual for the application of the AQEM system. A comprehensive method to assess European streams using benthic macroinvertebrates, developed for the purpose of the Water Framework Directive. Version 1.0, February 2002. Available from: www.aqem.de 2. Lampert W., Sommer U. 2007. Limnoecology. The ecology of lakes and streams. The second edition. Oxford University Press.

3. Forms of verification

Continuous evaluation of knowledge, activities and practical skills	
Grades	Grades are awarded on a scale of A-F, where A is the best and F is a fail. An excellent performance (A) – the student actively participates in the laboratory (fieldwork) activities, demonstrates an excellent understanding of the laboratory or fieldwork procedures (its aims, sequence and outcomes) and is engaged and creative in solving current problems and in assessing and presenting the laboratory (fieldwork) results. A good performance (C) – the student demonstrates good judgment and

	knowledge, correctly performs the laboratory and fieldwork, correctly exhibits a sense of the laboratory procedures and tasks, properly assesses and presents their results. A satisfactory performance (E) – the student demonstrates satisfactory judgment and knowledge, is poorly engaged and needs additional help to finish the laboratory procedures and tasks or fieldwork and the final assessment of their results correctly, presents a satisfactory presentation of the laboratory results. A performance that does not meet the minimum academic criteria (F) – the student is not engaged in the laboratory procedures (tasks) or fieldwork, does not exhibit a sense of laboratory or fieldwork, poorly interprets and presents their results.

Reports from realised laboratory and field projects	
Evaluation	Evaluation comprises the judgment and knowledge related to the sense and methods of the laboratory work (fieldwork), engagement in the realisation, quality of the assessment and presentation of practical results and use of reference materials. Grades for reports are awarded on a scale of A-F, where A is the best and F is a fail. An excellent report (A) – without any essential errors Fail (F) – no report

Final exam	
Grades	Grades are awarded on a scale of A-F, where A is the highest and F is a fail. Excellent (A) – the student presents fluent knowledge of the principles underlying hydrobiology, the basic issues concerning the characteristics of the freshwater environment and other aspects of hydrobiology, has made minimal errors that do not affect the quality of the exam. Good (C) – the student presents good knowledge of the principles underlying hydrobiology, the basic issues concerning the characteristics of the freshwater environment and other aspects of hydrobiology and makes rare but subtle errors. Satisfactory (E) – the student exhibits satisfactory knowledge, but with a poor understanding of the principles underlying hydrobiology, the basic issues concerning the characteristics of the freshwater environment and other aspects of hydrobiology and makes subtle errors. Fail (F) – the student does not present satisfactory knowledge of the basic issues concerning the characteristics of the freshwater environment and other aspects of hydrobiology and makes many substantial errors, which disqualify their test.