1.	**Field of study**	**Aquamatics - Interdisciplinary Management of Water Environments**
2.	Faculty	Faculty of Natural Sciences
3.	Academic year of entry	2025/2026 (winter term)
4.	Level of qualifications/degree	second-cycle studies
5.	Degree profile	general academic
6.	Mode of study	full-time

7.	**General information about the module**
Module name	**Environmental statistics and modelling**
Module code	AQ_017
Number of the ECTS credits	6
Language of instruction	English
Purpose and description of the content of education	The course in Environmental Statistics and Modelling will provide the student with the skills to go on to a career in this exciting area. Students will learn how models of environmental processes are developed and applied across a range of areas including climate change and the analysis of biodiversity. Students will gain an appreciation of all aspects of environmental modelling ranging from the philosophy of model development, focussing on links to observations and uncertainty analysis, through to more practical aspects such as numerical approximation and algorithm development and testing. The course aims to complete and deepen the knowledge already acquired by students in the field of statistics during the three-year degree course, providing concepts and methodologies useful for environmental sciences, with particular attention to univariate statistics, and mentions of multivariate statistics and geostatistics.
List of modules that must be completed before starting this module (if necessary)	not applicable

8. Learning outcomes of the module

Code	Description	Learning outcomes of the programme	Level of competenc (scale 1-5)
01	Knowledge on univariate statistics applied to spatial analysis: multiple way ANOVA, ANCOVA and regression, with particular attention to the variable selection methods.	AQ2_W01 AQ2_W07	3 3
02	Knowledge on the fundamental elements of multivariate statistics and geostatistics.	AQ2_U07 AQ2_W01	2 2
03	Knowledge on the basic principles of machine learning, with particular attention to neural networks and random forest	AQ2_W01 AQ2_W07	4 4
04	Ability to apply ANOVA and regression to experimental and spatial data, using statistical software;.	AQ2_U02	3
05	Ability to correctly choose the most appropriate instruments for their own analysis, based on the possibility and limits of the various approaches available.	AQ2_U02 AQ2_U03	4 4
06	Ability to carry out simple multivariate or geostatistical analyses	AQ2_U02	2

9.	Methods of conducting classes	
Code	**Category**	**Name (description)**
a01	Lecture methods / expository methods	Formal lecture/ course-related lecture *a systematic course of study involving a synthetic presentation of an academic discipline; its implementation assumes a passive reception of the information provided*
b05	Problem-solving methods	Activating method – seminar / proseminar *a seminar method; usually an oral presentation of a previously studied/diagnosed problem delivered on a forum; it aims at provoking a discussion concerning the results of research work; a type of conference, course or training session modelled on seminar classes*
e01	Practical methods	Laboratory exercise / experiment *[also conducted as fieldwork] a method of practical application of knowledge; implemented in three stages: the recognition of a problem induced by the task content, the formulation of the problem and the attempt to solve it accompanied by the assessment of the effects; the goal is to acquire skills, abilities and habits, and to consolidate the acquired knowledge so that it becomes operational; the laboratory method assumes greater independence of learners than carrying out an experiment*
e04	Practical methods	Project scheduling *proceeding according to the steps proposed within a specific methodology for the completion of a task; e.g., identifying project objectives, determining the result, identifying strengths, limitations, opportunities and threats (SWOT), establishing a schedule of activities, assessing resources, establishing an implementation plan; the initial diagnosis; the reassessment of assumptions; the process of preparing the practical implementation of a project*

10.	Forms of teaching				
Code	**Name**	**Number of hours**	**Assessment of the learning outcomes of the module**	**Learning outcomes of the module**	**Methods of conducting classes**
01	workshop	60	course work	01, 02, 03, 04, 05, 06	a01, b05, e01, e04

11.	The student's work, apart from participation in classes, includes in particular:		
Code	**Category**	**Name (description)**	**Is it part of the BUNA?**
a02	Preparation for classes	Literature reading / analysis of source materials *reading the literature indicated in the syllabus; reviewing, organizing, analyzing and selecting source materials to be used in class*	No
c02	Preparation for verification of learning outcomes	Studying the literature used in and the materials produced in class *exploring the studied content, inquiring, considering, assimilating, interpreting it, or organizing knowledge obtained from the literature, documentation, instructions, scenarios, etc., used in class as well as from the notes or other materials/artifacts made in class*	No
d01	Consulting the results of the verification of learning outcomes	Analysis of the corrective feedback provided by the academic teacher on the results of the verification of learning outcomes *reading through the academic teacher's comments, assessments and opinions on the implementation of the task aimed at checking the level of the achieved learning outcomes*	Yes

Information on the details of the module implementation in a given academic year can be found in the syllabus available in the USOS system: https://usosweb.us.edu.pl.