

of the Senate of the University of Silesia of 23 January 2024

## **Curriculum of the International Environmental Doctoral School**

**associated with the Centre for Polar Studies at the University of Silesia in Katowice**

**from the academic year 2024/2025**

1. The education at the International Environmental Doctoral School associated with the Centre for Polar Studies at the University of Silesia in Katowice (hereafter: IEDS) is provided jointly by the University of Silesia in Katowice (UŚ), the Institute of Geophysics of the Polish Academy of Sciences (IGF PAN), the Institute of Mathematics of the Polish Academy of Sciences (IM PAN) and the Institute of Oceanology of the Polish Academy of Sciences (IO PAN).

2. The education at the IEDS is provided in the disciplines of: mathematics, biological sciences, earth and environmental sciences (in the field of natural sciences) and materials science and engineering (in the field of engineering and technology).

3. The education in the doctoral school is provided on the basis of the curriculum and the individual research plan presented by the PhD candidate within 12 months of the start of education at the doctoral school.

4. Fundamentals of the curriculum:

1) education in the IEDS lasts 4 years, i.e. 8 terms. Classes are credited on an annual basis;

2) the curriculum includes compulsory modules (including elective modules) and an optional modern language module. The mandatory modules consist of the following components:

a) the general modules (Editing scientific texts and the publication process, Databases in scientific research, Intellectual property law and research ethics, Practical aspects of raising funds for scientific research and managing research projects, Scientific and professional career planning) attended by all the PHD candidates in the first two years of education are designed to provide the necessary knowledge, skills and tools to function efficiently in the scientific community,

b) degree programme modules - providing specialised education in the selected teaching path consistent with the scientific profile of the PhD candidates,

c) interdisciplinary extracurricular classes - related to the interdisciplinary context of scientific research - taught in the form of elective modules,

d) presentation of research results - modules that develop the skills of self-presentation and academic discussion,

e) seminars - the basic module leading to preparation of the PhD dissertation,

f) internships - developing the competencies in the scope of teaching, especially at the academic level, and promotion of scientific research results,

g) specialised (foreign) courses - related to internationalisation of education; they can be taught in the form of individualised courses taken in prestigious foreign centres;

3) classes are grouped into subject areas (not applicable to seminars, internships, modern language and foreign courses) and taught in the buildings owned by the entities that jointly operate the IEDS or in the field;

4) the module coordinators are lecturers affiliated with the entities jointly operating the IEDS;

5) education is provided in Polish or English. Modules are taught in Polish if the teacher and all the participants declare that they know Polish. If the teacher or any of the students declare that they do not know Polish, classes are taught in English;

6) the following grades are used for evaluation of learning outcomes: CREDITED (ZAL) for a positive grade, NOT CREDITED (NZAL) for a negative grade. If it is necessary to confirm the achieved learning outcomes expressed on a scale between 2.0 and 5.0, for the purposes of external entities, the PhD candidate will receive 5.0 for a credited module, and 2.0 for a module not credited;

7) a PhD candidate may take additional courses in the modules organised by the IEDS or, with the consent of the Dean of the IEDS, modules at other doctoral education entities for which the PhD candidate will receive ECTS credits;

8) classes may be taught, and verification of achievement of learning outcomes may be implemented, in the face-to-face mode, in the remote mode via means of electronic

communication (in synchronous or asynchronous mode) or in hybrid mode, combining face-to-face classes with classes taught via means of electronic communication;

9) the curriculum applies from the 2024/2025 academic year.

## Framework Programme

### YEAR I

<b>Module</b>	<b>Entities coordinating the module</b>	<b>Type of classes</b>	<b>Form of verification of learning outcomes</b>	<b>Number of hours</b>	<b>ECTS</b>
Editing scientific texts and the publication process	University of Silesia	Workshop	Credit	20	2
Databases in scientific research	University of Silesia	Workshop	Credit	16	2
Intellectual property law and research ethics	University of Silesia	Tutorial classes	Credit	15	1
Degree programme module I: Critical overview of contemporary scientific developments	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Workshop	Credit	16	2
Interdisciplinary extracurricular class I	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute	By module description	Credit	16	2

	of Mathematics of the Polish Academy of Sciences				
Presentation of research results I	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Workshop	Credit	10	1
Seminar I	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Seminar	Credit	40	4
Internship I	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Internships	Credit	30-60	4
Modern language <sup>1</sup>	University of Silesia	Language course	Credit	10-60	1-4

<b>Total</b>				<b>163-193</b>	<b>18</b>
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<sup>1</sup> Optional classes, English language classes organised by the IEDS or another modern language classes within certified courses for which 1-4 ECTS credits will be awarded. The module may also include completion of a Polish language course for foreigners.

## YEAR II

<b>Module</b>	<b>Entities coordinating the module</b>	<b>Type of classes</b>	<b>Form of verification of learning outcomes</b>	<b>Number of hours</b>	<b>ECTS</b>
Practical aspects of raising funds for scientific research and managing research projects	University of Silesia	Workshop	Credit	16	2
Scientific and professional career planning	University of Silesia	Tutorial classes	Credit	10	1
Degree programme module II: Methodology workshop	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Workshop	Credit	16	2
Interdisciplinary extracurricular class II	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of	By module description	Credit	16	2

	the Polish Academy of Sciences				
Presentation of research results II	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Workshop	Credit	10	1
Seminar II	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Seminar	Credit	40	4
Internship II	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Internships	Credit	30-60	4
Modern language <sup>2</sup>	University of Silesia	Language course	Credit	10-60	1-4
<b>Total</b>				<b>138-168</b>	<b>16</b>

<sup>2</sup> Optional classes, English language classes organised by the IEDS or another modern language in certified courses for which 1-4 ECTS credits will be awarded. The module may also include completion of a Polish language course for foreigners.

### YEAR III

<b>Module</b>	<b>Entities coordinating the module</b>	<b>Type of classes</b>	<b>Form of verification of learning outcomes</b>	<b>Number of hours</b>	<b>ECTS</b>
Degree programme module III: Current research challenges	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Workshop	Credit	16	2
Interdisciplinary extracurricular class III	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	By module description	Credit	16	2
Presentation of research results III	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Workshop	Credit	10	1
Seminar III	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute	Seminar	Credit	40	4

	of Mathematics of the Polish Academy of Sciences				
Internship III	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Internships	Credit	30-60	4
<b>Total</b>				<b>112- 142</b>	<b>13</b>

#### YEAR IV

<b>Module</b>	<b>Entities coordinating the module</b>	<b>Type of classes</b>	<b>Form of verification of learning outcomes</b>	<b>Number of hours</b>	<b>ECTS</b>
Presentation of research results IV	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Workshop	Credit	10	1
Seminar IV	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	Seminar	Credit	40	4
Internship IV	University of Silesia, Institute of Oceanology	Internships	Credit	30-60	4



	of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences				
<b>Total</b>				<b>80-110</b>	<b>9</b>

#### YEAR I - IV

<b>Module</b>	<b>Entities coordinating the module</b>	<b>Type of classes</b>	<b>Form of verification of learning outcomes</b>	<b>Number of hours</b>	<b>ECTS</b>
Foreign (specialised) courses	University of Silesia, Institute of Oceanology of the Polish Academy of Sciences, Institute of Mathematics of the Polish Academy of Sciences	In accordance with the terms of the course	In accordance with the terms of the course	At least 75 throughout the course of education	5
<b>Total</b>				At least 75 throughout the course of education	<b>5</b>

**Total mandatory classes: 568-688 h/ 61 ECTS**

Module description:

<b>Module</b>	<b>Description</b>	<b>Learning outcomes<sup>3</sup></b>	<b>Notes</b>
<b>COMPULSORY MODULES</b>			
Editing scientific texts and the	The module provides knowledge and skills in	P8S_UK P8S_KO	Modules taken by all the PhD candidates

<p>publication process</p>	<p>the development of scientific texts in accordance with applicable standards. The class includes a workshop on how to prepare a manuscript of a scientific paper, taking into account the requirements of editorial teams of scientific journals. The module develops skills in using literature databases and creating bibliographies. PhD candidates will learn about the criteria for reviewing articles and good practices for responding to reviews.</p>	<p>P8S_KR</p>	
<p>Databases in scientific research</p>	<p>The module provides knowledge and skills in the use of factual databases, their structure and access rules. PhD candidates will be introduced to methods of preparing and managing data in accordance with FAIR data guidelines, and will acquire skills to create a data management plan</p>	<p>P8S_WG P8S_UW P8S_KO P8S_KR</p>	

	(DMP) for their own research and project applications.		
Intellectual property law and research ethics	The module provides knowledge and skills in its application in the scope of intellectual property law in relation to the conduct of scientific research and the publication of its results in a manner consistent with the regulations of mandatory provisions of the law and binding ethical standards applicable to researchers. A PhD candidate will become familiar with legal and ethical regulations and good practices in the management and use of objects of so-called intellectual property developed in the course of scientific research.	P8S_WK P8S_KR	
Practical aspects of raising funds for scientific research and	The module presents the principles of successful preparation of scientific projects, helps to develops the ability to	P8S_UO P8S_UU P8S_KR	

<p>managing research projects</p>	<p>build a project team and assign roles in it, define the position of the project manager and good practices in project management, from creation of a proposal to financial settlement of a project. PhD candidates will gain knowledge of current research funding mechanisms and acquire skills in writing project proposals and submitting them to selected science funding entities.</p>		
<p>Scientific and professional career planning</p>	<p>The module prepares a PhD candidate to work in scientific and higher education entities in Poland and abroad. PhD candidates will gain knowledge of and skills in scientific career planning and activities to enhance their success in the job market in the fields of science, higher education, research and development. Available internship and scholarship programmes</p>	<p>P8S_UK P8S_UO P8S_UU</p>	

	at renowned academic and research centres are discussed. The module helps to develop teamwork skills.		
Degree programme module I: Critical overview of contemporary scientific developments	The module provides expanded knowledge of the discipline in which the dissertation is being prepared.	P8S_WG P8S_UW	<ul style="list-style-type: none"> <li>• Modules taught separately for the following specialisation groups, according to the affiliation of the PhD candidate (coordinating entity in parentheses): - Mathematics (IM PAN) - Materials Engineering (Faculty of Science and Technology of the University of Silesia) - Earth and Environmental Sciences - Geophysics (IGF PAN) - Earth and Environmental Sciences - Oceanology (IO PAN)</li> </ul>
Degree programme module II: Methodology workshop	The module helps to develop skills in specialised research methods, advanced techniques, tools and applications used in earth and environmental sciences, biological sciences, mathematics and materials science and engineering.	P8S_UW P8S_KK	<ul style="list-style-type: none"> <li>- Earth and Environmental Sciences</li> <li>- Natural Environment (Faculty of Natural Sciences of the University of Silesia) - Biological Sciences (Faculty of Natural Sciences of the University of Silesia)</li> </ul>
Degree programme module III: Current research challenges	The module provides knowledge and skills in research challenges in the discipline in which the doctoral dissertation is being prepared, taking into account the latest scientific developments and social needs.	P8S_WG P8S_UW P8S_KK	<ul style="list-style-type: none"> <li>- Earth and Environmental Sciences</li> <li>- Natural Environment (Faculty of Natural Sciences of the University of Silesia) - Biological Sciences (Faculty of Natural Sciences of the University of Silesia)</li> </ul>

			<ul style="list-style-type: none"> <li>• Upon the PhD candidate's application, accompanied by the supervisor's opinion, the dean of the International Environmental Doctoral School may grant permission for the PhD candidate to take a course, designed for PhD candidates, in an external entity, for which at least 2 ECTS will be awarded.</li> <li>• A PhD candidate may take more courses within the degree programme module, intended for other specialties, for which additional ECTS credits will be awarded.</li> </ul>
Interdisciplinary extracurricular class I-III	A series of modules presenting current research issues in earth and environmental sciences, biological sciences, mathematics and materials science and engineering, presented from an interdisciplinary perspective. PhD	P8S_WG P8S_WK P8S_UW P8S_KK	<ul style="list-style-type: none"> <li>• Prior to the start of the academic year, each entity jointly operating the International Environmental Doctoral School will submit a minimum of 3 course proposals to the IEDS Council for approval, along with descriptions and information on the</li> </ul>

	<p>candidates will become familiar with methods, tools and results of research in connection with related research disciplines, which will allow to shape the transfer of knowledge and skills among disciplines and find cognitive niches at the interface of different scientific disciplines.</p>		<p>discipline to which they refer.</p> <ul style="list-style-type: none"><li>• PhD candidates choose from among the courses approved by the Council of the International Environmental Doctoral School.</li><li>• From the first to the third year of education, PhD candidates will complete a total of no less than 3 courses (at least 1 course per year), with at least 2 of them in a discipline other than the one in which the dissertation is being prepared.</li><li>• Upon the PhD candidate's application, accompanied by the supervisor's opinion, the dean of the International Environmental Doctoral School may grant permission for the PhD candidate to take a course, designed for PhD candidates, in an external entity, for which at least 2 ECTS will be awarded.</li></ul>
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			<ul style="list-style-type: none"> <li>• A PhD candidate may take more courses in interdisciplinary extracurricular classes, for which additional ECTS credits will be awarded.</li> </ul>
Presentation of research results I-IV	<p>The module helps to shape the skills of presenting research achievements in a scientific forum, including the presentation of theses, results and conclusions. PhD candidates will learn and apply in practice the proper structure of presentations and be guided by the principles and good practices of scientific presentation and discussion; they will learn and improve various forms of scientific presentation, argumentation skills and how to defend their views. PhD candidates acquire the skills to conduct academic discussions and express</p>	<p>P8S_WG P8S_UK P8S_KK</p>	<ul style="list-style-type: none"> <li>• The module coordinator is the dean of the IEDS or a person designated by them.</li> <li>• The module is organised jointly for all the IEDS PhD candidates on the same dates.</li> <li>• PhD candidates present the results of their research in the form of a presentation (multimedia presentation, poster, etc.) and hold an academic discussion in English.</li> <li>• The module is attended by supervisors and invited experts.</li> <li>• For second-year PhD candidates, the module can be credited for a presentation at a seminar</li> </ul>



	<p>substantive opinions on the content of presentations. The module also allows annual monitoring of the progress of doctoral projects.</p>		<p>organised as part of the mid-term evaluation.</p> <ul style="list-style-type: none"> <li>• Upon the PhD candidate's application, together with the opinion of the supervisor, the dean of the IEDS may grant permission to credit the module on the basis of a report on presentation and active participation in a scientific discussion during an open scientific seminar with the participation of experts in the discipline in which the doctoral dissertation is being written. The report is confirmed with the signature of the seminar organiser or session leader, as well as the supervisor.</li> </ul>
<p>Seminar I-IV</p>	<p>The module includes a group of activities aimed at providing the PhD candidate with the knowledge and skills to prepare and submit the doctoral dissertation. During the seminars,</p>	<p>P8S_WG P8S_UW P8S_UU P8S_KR</p>	<p>The seminar is coordinated by the supervisor or by the doctoral seminar coordinator designated by the dean.</p>

	<p>formal and substantive issues related to preparation of the doctoral dissertation will be discussed and the progress of the work will be monitored on an ongoing basis. The seminars will include consultations with experts, and PhD candidates will participate in formal or informal research teams, group and individual classes with the seminar coordinator or supervisor, as well as additional classes and courses as indicated by the supervisor.</p>		
<p>Internships I-IV</p>	<p>The module will prepare the PhD candidate to give classes at the academic level, to promote scientific results and develop pro-environmental attitudes. During the course of the module, the PhD candidate will acquire teaching skills by participating in</p>	<p>P8S_WK P8S_UW P8S_UK P8S_UU P8S_KO</p>	<ul style="list-style-type: none"> <li>• Executed by teaching or participating in the teaching of academic classes of at least 30 teaching hours per year (but no more than 60 teaching hours) or, if the specific character of the activities of the entity jointly running the IEDS with which the PhD candidate is affiliated</li> </ul>

	<p>academic classes taught by experienced teachers, as well as by observing and assisting in the process of teaching. These skills are used when teaching the classes assigned individually. The PhD candidate will also use the acquired skills in other teaching and promotion activities, by taking part in or teaching workshops, seminars and participating in other activities related to the transfer of knowledge to different audiences.</p>		<p>does not allow it - in the form of other documented teaching or promotion activities (preparation and teaching of classes, workshops, seminars; participation in science festivals and others) of 60 hours per year.</p> <ul style="list-style-type: none"> <li>• At the request of the PhD candidates affiliated with the other entities jointly operating the IEDS, the University of Silesia in Katowice will organise internships in the form of teaching classes or participating in teaching classes at the University of Silesia in Katowice.</li> <li>• A first-year PhD candidate pursuing an internship in the form of academic teaching will carry out the internship by holding 30 hours of classes (observation, assisting, preparing materials and supervising the conduct of classes, and others).</li> </ul>
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			<ul style="list-style-type: none"> <li>• A second-, third- or fourth-year PhD candidate pursuing an internship in the form of academic teaching may carry out the internship independently by teaching part of the course in accordance with the assignment.</li> <li>• The coordinator of the PhD candidate's internship is the supervisor or auxiliary supervisor affiliated with the same entity, or a person designated by the dean of the International Environmental Doctoral School.</li> </ul>
Foreign (specialised) courses	The module provides specialised knowledge and skills through participation in classes held at renowned foreign scientific and research centres. Classes are profiled to meet the needs of the PhD candidate in the scope of the dissertation they are writing. As part of this module, PhD candidates	P8S_WG P8S_UW P8S_UKP8S_UO	<ul style="list-style-type: none"> <li>• Courses are delivered in face-to-face, hybrid or remote form at foreign scientific or research and development units.</li> <li>• The module includes courses dedicated to PhD candidates or, with the approval of the dean, other highly specialised courses.</li> <li>• Courses can be taught throughout the entire</li> </ul>

	acquire competences in working in international teams, and become familiar with the latest methods and techniques used in scientific research		<p>period of education at the doctoral school (years I-IV).</p> <ul style="list-style-type: none"> <li>• Courses can be taught in the form of one or several activities, for which a PhD candidate will receive a total of no less than 5 ECTS credits from the units organising them.</li> <li>• The selection, application and implementation of the course are the responsibility of the PhD candidate in consultation with the supervisor.</li> <li>• Before the course, A PhD candidate will submit a proposal accompanied by their supervisor's opinion, to be approved by the dean.</li> </ul>
<b>OPTIONAL MODULE</b>			
Modern language	This optional module helps to develop skills in the use of a modern foreign language, primarily in academic communication.	P8S_UK	<ul style="list-style-type: none"> <li>• English classes are organised by the IEDS in face-to-face, remote or hybrid formats.</li> <li>• 1-4 ECTS credits are awarded for the completion of classes in</li> </ul>

			<p>the modern language organised in the entities that jointly operate the IEDS in certified courses.</p> <ul style="list-style-type: none"> <li>• The module may also include the completion of a Polish language course for foreigners.</li> </ul>
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<sup>3</sup> Code of the description component in the characteristics of level 8 of the Polish Qualification Framework under the Regulation of the Minister of Science and Higher Education on Second-Cycle Characteristics of Learning Outcomes for Qualification at Levels 6-8 of the Polish Qualification Framework of 14 November 2018 (Journal of Laws of 2018, item 2218).