

## Doctoral Program in Environmental Studies

### ■ Doctor of Philosophy in Environmental Studies

#### Program Educational Objectives

The persons who logically elucidate the causes and process of the problems regarding the local/global-scale issues, based on scientific and clinical insight and can suggest the measures for problem-solving from a global view. Along with the specialization and creativity of international standard in sciences, engineering, agricultural science and social science etc, an ability to see from bird's eye, practical ability, an ability for logical constitution, expressiveness, and communication skills shall be cultivated and highly specialized practitioners, researchers and educators who can play an active role as global leaders shall be fostered.

<b>Graduate Profile</b>	<ul style="list-style-type: none"> <li>- The persons who have high specialization in each area of expertise and an ability to see from a higher perspective relating to general environmental sciences and additionally, who have practical ability and management ability to play an active role as researchers/educators in universities/educators.</li> <li>- Highly specialized practitioners who are engaged in planning and carrying out international cooperation projects etc. by specialization and an ability to see from bird's eye in international institutions, international cooperation agencies and overseas division etc. in firms etc.</li> </ul>
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**Diploma Policy**

The degree of Doctor of Philosophy in Environmental Studies is commenced to those who have fulfilled the requirements for the completion of the Doctoral programs, as set out in the Graduate School Regulations of the University of Tsukuba and related university regulations, and who are deemed to have the following competences.

	Competences	Evaluation perspectives
<b>Knowledge and Skills</b>	1. Knowledge creation competence: Ability to create new knowledge that can contribute to future society	① Are there any research findings that can be considered new knowledge? ② Can we expect you to create knowledge that will contribute to future society?
	2. Management competence: Ability to plan and implement measures to identify and solve challenges from a higher perspective	① Can you make and implement long-term plans for critical challenges? ② Can you identify challenges, even in other areas of expertise, and solve them from a higher perspective?
	3. Communication competence: Ability to express the true nature of academic findings positively and clearly	① Can you explain the true nature of research content and specialized knowledge clearly and logically to researchers from different areas and to people other than researchers? ② Do you proactively share your findings with researchers and experts from your field of expertise and accurately answer questions?
	4. Leadership competence: Ability to have objectives get accomplished under your leadership	① Can you set attractive and compelling goals? ② Are you capable of building systems to realize goals and accomplish objectives as the leader?
	5. Internationality competence: Possession of a high level of awareness and motivation to be internationally active and contribute to international society	① Do you have strong awareness and motivation to contribute to international society and international activities? ② Have you obtained adequate linguistic skills for international information collection and action?
	6. Specialized comprehension ability/analysis ability: an ability to quantitatively and qualitatively grasp actual conditions, comprehension/analysis ability based on scientific technologies relating to the issues	① If capable of quantitatively and qualitatively grasp actual conditions, comprehension/analysis ability based on basic/practical scientific technologies relating to the issues. ② If capable of carrying out analysis and expectation that leads to problem solving.

	Competences	Evaluation perspectives
<b>Knowledge and Skills</b>	7. Application ability: an ability to consider the purpose and process in order to apply academic knowledge to society.	① If capable of considering scientific technological comprehension/analysis results relating to the issues in connection with problem-solving. ② If capable of investigating by connecting the academic knowledge and social request relating to the issues.
	8. Suggestion ability: an ability to suggest concrete solutions relating to the issues.	① If capable of understanding systems/policies etc. relating to the issues by seeing from bird's eye. ② If capable of investigating and suggesting solutions by respecting the local characteristics etc. relating to the issues.
	9. Ability for problem-solving: an ability to investigate the solutions based on academic knowledge/ social request relating to the issues.	① If capable of understanding quantitatively and qualitatively unbalanced problems of various scales relating to the issues. ② If capable of investigating the process to lead the issues to solutions based on comprehension of local characteristics and global-scaled vision.
<b>Guidelines for Assessing Learning Outcomes</b>	The evaluation of learning outcomes is conducted through achievement assessments based on the "Achievement Assessment Sheet". This process objectively verifies and evaluates the acquisition of competences aligned with the degree conferral policy at each stage. The stages and methods of achievement assessment are outlined below. The acquisition status of competences is confirmed once at the end of the first year, once during the mid-term presentation in the second year, and once at the time of master's thesis submission, based on the "Achievement Evaluation Sheet".	

<p><b>Evaluation Criteria for Degree Theses/ Dissertations</b></p>	<p>The thesis that satisfies all the following evaluation items shall be a pass as the thesis for doctoral degree after going through the final examination.</p> <p><b>【Evaluation items】</b></p> <ol style="list-style-type: none"> <li>1. The positioning and originality of the academic research outcomes in the said research is clearly described.</li> <li>2. The data and materials etc. presented are necessary and sufficient to draw a conclusion.</li> <li>3. The hypothesis, assumption and statement are logic and reasonable.</li> <li>4. The development of the research outcomes toward relevant areas are available.</li> </ol> <p><b>【Requirements】</b></p> <p>At the time of submitting application for the thesis examination for doctoral degree (upon application for the doctoral degree), the applicants need to publicize one or more first author original papers which the applicant directly relate to the doctoral thesis; however, these shall include the original paper whose publication has been already decided. The original paper shall be publicized in domestic and overseas academic journals.</p> <p>The applications of the doctoral thesis subject to Article 44, Paragraph 2 of School Regulations shall satisfy any of the following requirements; however, these shall include the original paper whose publication has been already decided.</p> <ol style="list-style-type: none"> <li>(1) In the case of the students of doctoral degree after completing a course of study, such students need to publicize two or more first author original papers which the applicant directly relate to the doctoral thesis; however, these shall include the original paper whose publication has been already decided.</li> <li>(2) In the case of the students of Early Completion Program for working individuals, need to publicize two or more first author original papers which the applicant directly relates to the doctoral thesis. One original paper, which has been published before the admission, is acceptable.</li> </ol> <p><b>【Examination system】</b></p> <p>As the examination system, the preliminary examination committee shall be established, which is composed of three or more faculty members including one or more members of Degree Program Faculty Meeting, other than the chief examiner as a thesis supervisor.</p> <p>The preliminary examination committee shall be held at least once, where the requirements of applications for degree awarding examination shall be confirmed, the contents and presentability of the thesis shall be examined and instruction shall be provided for their modification and then the judgement if the examination for the doctoral thesis shall be worth starting.</p> <p>Additionally, the presentation for the doctoral thesis shall be held in public before and after the preliminary examination committee. The time for the presentation for the doctoral thesis shall be approximately one hour. The applicants shall present the contents of the thesis for approximately 40 minutes and the questions and answers shall be subsequently conducted for approximately 20 minutes.</p>
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<p><b>Evaluation Criteria for Degree Theses/ Dissertations</b></p>	<p>The examination committee for the doctoral thesis shall be established, which shall be composed of three or more faculty members including one or more members of Degree Program Faculty Meeting, other than the chief examiner as the thesis supervisor of the course.</p> <p>The examination committee for the doctoral thesis can include the faculty members of other graduate schools or the research institutes outside the university.</p>
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**Curriculum Policy**

This Degree Program shall constitute the curriculum to have the students understand and expect the mechanism of generation of regional- and global-scale issues, intend to present their solutions and cultivate an ability to collect/analyze information, communication skills, practical ability and an ability to suggest based on bird's eye view for the specialization and issues of sciences, engineering, agricultural science and social science etc. In detail, in order to acquire comprehensive/analysis ability, ability to correspond to issues and ability to suggest required for diploma, especially the ability to solve the problems including water resources/aquatic environment, living resources/biodiversity, urban problems, disaster/disaster prevention etc., emphasis shall be put on fostering the ability necessary for contribution of problem solving based on the foundation and specialty of sciences, engineering, agricultural science and social science, with the ability to see from a higher perspective.

<p><b>Curriculum Design Framework</b></p>	<p>Advanced knowledge and international competence/innovativeness for the research for the doctoral thesis relating to environmental sciences shall be tested/evaluated in the course of the educational program and by these, the students can get credits. Through these, specialization, macroscopic visibility and analysis ability etc. necessary for internationally competent doctors (environmental sciences) shall be secured. Additionally, through course work and internship classes, an ability to analyze problems, practical ability and communication skills etc. shall be cultivated. Through the course work and internship classes such as Forum on Environmental Studies and Practicums etc., practical abilities such as management ability, communication skills, expressiveness, an ability to judge and suggest etc. shall be cultivated. By implementation of research for the doctoral thesis through Exercise of Environmental Studies etc., an ability to integratedly promote research etc., such as an ability for area surveys, an ability for analytics/analysis of information, an ability for lab work, group ability and modelling ability etc. shall be cultivated.</p>
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<b>Teaching and Learning Methods</b>	<ul style="list-style-type: none"> <li>- Exercise of Environmental Studies I, II (1 credit for each) shall be the compulsory courses and the courses relating to course work (Forum on Environmental Studies I, II, and Environmental Science Practicum I, II) shall be the selective compulsory courses.</li> <li>- Upon commencing the 1<sup>st</sup> year, for all the students the advisory committee (research supervision team) composed of the team of a chief supervisor and several sub supervisors shall be established to organize validity and problems of research plan for each student. Additionally, instruction such as confirmation etc. of such as the courses registered, and the credits acquired and evaluation for progress in the research for the doctoral thesis shall be implemented. The advisory committee shall participate in other master' programs, as necessary.</li> </ul>
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**Admission Policy**

<b>Desired Student Profile</b>	<ul style="list-style-type: none"> <li>- The person with knowledge and quality regarded as distinguished in the master's degree level in any area of sciences, engineering, agricultural science and social science.</li> <li>- The person with intellectual curiosity, ability for logical thinking and ability to summarize necessary to work on interdisciplinary research for environmental sciences and who have acquired an ability to autonomously conduct learning related to their relevant surrounding areas.</li> <li>- The person with a sense of mission, a sense of justice and a sense of ethics necessary to play an active role in international society as a global leader and who has acquired motivation to pioneer new academic areas and issues by himself/herself, a positive attitude in order to realize them, an ability to continue them patiently and a flexible and strong spirit.</li> <li>- The person with a motivation to write presentation in international academic conferences, to submit papers and to write the doctoral thesis in English.</li> <li>- The person with a motivation to work on the issues on a global scale related to sustainable development objectives as a global leader and contribute to preparation/implementation of policies in English and future vision.</li> <li>- In addition to the above-mentioned, as for the working professionals, practical skills and management ability acquired by business experience so far shall also be evaluated.</li> </ul>
<b>Student Selection Process</b>	<p>The following three items shall be evaluated and comprehensively judged.</p> <ul style="list-style-type: none"> <li>- If the student can explain the research contents in the master's course, and (or) the research and practical achievements conducted so far etc. accurately and logically.</li> <li>- If capable of accurately and logically explain the contents of research in the master's course and/or research/business performance etc. so far.</li> <li>- Judged by presentation regarding knowledge/qualities, abilities and motivation indicated in the above-mentioned "Desired Student" .</li> </ul>

**Learning Support Framework**

<p><b>Academic Support</b></p>	<p>For academic advising, student life, employment, and harassment-related consultations, support systems are established through designated committees: the Curriculum Committee, Student Counseling Support Committee, Employment Committee, and Harassment Countermeasures Committee. Additionally, writing support and presentation guidance are provided through the required course “Exercise of Environmental Studies” for all students.</p>
<p><b>Opportunities for Peer Interaction</b></p>	<p>We have established an online platform for information exchange accessible to all students enrolled in the degree program, promoting interaction among students. Furthermore, we utilize a tutor system for international students to encourage interaction among all students, including international students. Additionally, we ensure ample time for group work in lectures and seminars for required courses such as "Forum on Environmental Studies".</p>
<p><b>Opportunities for Student-Faculty Interaction</b></p>	<p>We have established an online platform for information exchange accessible to all students enrolled in degree programs and all professors, promoting interaction between students and faculty members. In addition to the main supervisor, a system will be established where two or more faculty members within the degree program serve as vice-supervisors for each student, providing regular guidance. This will also promote interaction between students and faculty members other than their main supervisor.</p>

**Approaches to Assuring and Enhancing Educational Quality**

The Curriculum Committee conducts reviews of all educational activities and evaluates student learning outcomes to verify the validity of the curriculum and the appropriateness of instruction. Specifically, the Curriculum Committee annually confirms that there are no discrepancies between the content of each course and the competences students can acquire. Furthermore, student feedback is gathered through faculty advisors and shared within the degree program via the Curriculum Committee and the Faculty Meeting. Faculty Development Committee is established within the degree program to systematically and proactively ensure and improve educational quality. Additionally, a framework is established to continuously address mid-term educational quality needs, verify the effectiveness of initiatives, and identify challenges through bodies such as the Degree Program Future Review Committee.