

## Master's Program in Environmental Sciences

### ■ Master of Environmental Sciences

#### Program Educational Objectives

It is necessary for highly specialized professionals who solve local and global issues to have a research/survey ability to analyze/understand the background of the problems from the higher/cross-sectional views, and further, an ability to suggest the solution of the said problems. In details, by fostering specialization and creativity on an international level cultivated from fusion of sciences, engineering, agricultural science and social science etc, and cultivating ability to see from a higher perspective, to practice, ability for immediate assets and communication skills, the capacity as a global leader shall be fostered.

<b>Graduate Profile</b>	<ul style="list-style-type: none"> <li>- The person with management skill: the person who has high specialization in each area of expertise and multidisciplinary perspective relating to general environmental sciences and is essential for various business management such as overseas activities by firms.</li> <li>- The practical person with specialization: the person who can smoothly carry out international cooperation projects etc. for which high specialization/survey ability is required in international institutions, international cooperation agencies and overseas division etc. in firms etc.</li> <li>- The person with leadership ability: the person who can effectively carry out international negotiation/negotiation between stakeholders etc. through group skills and high scientific communication skills, while making full use of high specialization and analysis ability/problem-solving ability in order to solve local and global-scale environmental issues.</li> </ul>
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**Diploma Policy**

The degree of Master of Environmental Sciences is commenced to those who have fulfilled the requirements for the completion of the Master's 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 application competence: Ability to contribute to society with advanced knowledge	① Can you apply knowledge gained through research and other activities in society? ② Can you identify new problems, even in other fields of expertise, based on broad knowledge?
	2. Management competence: Ability to appropriately address challenges from broad standpoints	① Can you take on major tasks with systematic planning? ② Can you understand and solve problems from multiple perspectives?
	3. Communication competence: Ability to accurately and clearly communicate expert knowledge	① Are you capable of efficient communication for research purposes? ② Can you discuss research or research-specific knowledge with experts from your own field and from other fields?
	4. Teamwork competence: Ability to work with a team and actively contribute to the achievement of goals	① Do you have experience cooperatively and actively working on challenges as part of a team? ② Have you helped promote projects and activities other than your own research?
	5. Internationality competence: Willingness to contribute to international society	① Are you aware of making contributions to international society and getting involved in international activities? ② Have you obtained the linguistic skills necessary for international information collection and action?
	6. Comprehensive ability/analysis ability: an ability to understand analyze and expect based on basic/applied science/technology relating to the issues.	① If capable of understanding the targeted issue through basic skills and applied skills of sciences, engineering, agricultural science and social science. ② If capable of carrying out analysis and expectation that leads to problem solving by grasping the issue quantitatively and qualitatively.
	7. Ability to correspond to issues: an ability to collect information from academic/social vision relating to the issues and to correspond to such issues.	① If capable of appropriately collecting academic and social information relating to the issue. ② If capable of taking appropriate measures for and coping with the issues based on collected information relating to the issue.

	Competences	Evaluation perspectives
<b>Knowledge and Skills</b>	8. Ability to suggest: an ability to investigate the solutions based on academic knowledge/social request relating to the issues.	① If capable of see systems/policies etc. from a higher perspective as well as from an academic vision relating to the issue. ② If capable of investigating the target for problem-solving with an academic and social vision relating to the issue.
<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".	
<b>Evaluation Criteria for Degree Theses/ Dissertations</b>	As the evaluation standard, the dissertation that satisfies all the following items shall be a pass as the thesis for master's degree after going through final examination. <ol style="list-style-type: none"> <li>1. The issue that can directly or indirectly contribute to solving environmental issues.</li> <li>2. Having examined the conventional research outcomes relating to the issue sufficiently.</li> <li>3. Indicating new knowledge in theoretical and demonstrative aspects for the issue.</li> </ol> As an evaluation method, the final examination for master's thesis shall be held in public and degree of completion of the thesis shall be evaluated. As the system of examination committee, the oral examination (final examination) by the expert committee composed of three examiners. Furthermore, the knowledge and academic skills in the said area and completeness of research shall be evaluated. The requirements for judgement as being a pass shall be as follows: completing interdisciplinary curriculum, acquiring the prescribed credits and carrying out research for master's thesis.	

## Curriculum Policy

This master's degree program shall intend to understand the mechanism of environmental issues caused on a local and global scale and to suggest their solutions and establish the curriculum to foster the ability to collect/analyze information, communication skills, to put things into practice and to suggest in addition to sciences, engineering, agricultural science and social science. 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>All the courses shall be held in English in principle.</p> <p>By generally introducing active learning, the educational environment where students with diverse nationalities and academic backgrounds improve themselves through friendly rivalry.</p> <p>As a specialized fundamental course, in addition to compulsory courses common to programs and selective compulsory courses common to courses, Inter-disciplinary Foundation Courses, Degree Programs' Common Courses and Graduate General Education Courses as elective compulsory courses shall be registered and broad culture and basic knowledge and skills of agro-biological resource sciences shall be acquired. The specialized lectures as specialized courses in area of expertise and practical training and special research as selective compulsory courses shall be registered and basic knowledge and skills of the area of expertise shall be learned.</p> <ul style="list-style-type: none"> <li>- Compulsory courses: all the students shall acquire the basic knowledge and academic skills by completing introduction/exercises/practices courses relating to the basics of environmental sciences and comprehend, analyze and consider environmental issues in an interdisciplinary way. By firmly linking classroom lectures and practical training activities, practical ability in order to solve environmental issues shall be cultivated.</li> <li>- Seminar courses: the courses that are related to the master's thesis research, which shall be evaluated in accordance with the unified standard, while taking advantage of the characteristics of each office.</li> <li>- Selective courses: Major Subjects established by special studies and the courses in other educational institutions including domestic and overseas universities in order to enhance specialization in each area. Within the issues, discussion among students and cooperative work shall be promoted and new inventive power as well as international understanding shall be fostered.</li> <li>- Practical training courses: Through training inside and outside Japan in which environment-related internships and inspections and workshops etc. are combined in the government, firms and NPOs etc., the ability as a practitioner shall be cultivated.</li> </ul>
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<p><b>Teaching and Learning Methods</b></p>	<ul style="list-style-type: none"> <li>- Foundation Subjects for Major : Introduction to Environmental Sciences (2 credits) and Exercises in Environmental Sciences (1 credit) shall be taken as compulsory subjects, which shall be provided in English.</li> <li>- Major Subjects: Lab Seminar in Environmental Sciences 1S ~ 2F (2 credit for each), Thesis Seminar in Environmental Sciences 1S · 1F (2 credit for each) and Thesis Seminar in Environmental Sciences 2S · 2F (3 credit for each), 18 credits in total shall be taken as compulsory courses. Besides, as selective courses, the courses of 6 or more credits shall be taken.</li> <li>- One or more credit from Graduate General Education Courses, Inter-disciplinary Foundation Courses and Degree Programs' Common Courses shall be taken as 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 chief supervisor and several sub supervisors shall be established to organize validity and problems of research plan for each student. Additionally, instruction shall be provided to confirm registered courses and acquired credits etc. The advisory committee shall participate in other master' programs, as necessary.</li> </ul>
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**Admission Policy**

<p><b>Desired Student Profile</b></p>	<ul style="list-style-type: none"> <li>- The person with basic academic skills regarded as distinguished in the course level in any area of sciences, engineering, agricultural science and social science.</li> <li>- The person with motivation to receive interdisciplinary education.</li> <li>- The person who has a deep interest in environmental issues and an interest in practical education toward their solutions.</li> <li>- The person with sense of mission, sense of justice, sense of ethics, ability to persistently continue and flexible and strong mental power etc., as well as a wide vision in order to play an active role in international society and basic quality.</li> <li>- The person with motivation to improve international communication skills such as carrying out presentation in academic conferences/international seminars.</li> <li>- The person with motivation to contribute to contribute to international society by making use of expertise of environment sciences in English in the future.</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>
<p><b>Student Selection Process</b></p>	<ul style="list-style-type: none"> <li>- The knowledge/quality, ability, motivation and English ability in the above-mentioned “Desired Students” shall be examined.</li> <li>- The students' abilities shall be observed regarding if they can logically and clearly explain the principle of research plan and relationship with the existing research etc.</li> </ul>

**Learning Support Framework**

<b>Academic Support</b>	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 “Lab Seminar in Environmental Sciences” and "Thesis Seminar in Environmental Sciences” for all students.
<b>Opportunities for Peer Interaction</b>	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 Exercise in Environmental Sciences.
<b>Opportunities for Student–Faculty Interaction</b>	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. We regularly schedule forums for discussion and exchange involving both students and faculty members, such as interim presentations for master's theses.

**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.