Master's Program in Geosciences

Master of Science

Program Educational Objectives

To train the human resources who understand various natural phenomena on the earth both in the past and at present, have a broad basic knowledge and a specialized research ability to contribute to the settlement of various issues on a global scale, and have scientific intelligence necessary to overcome such issues in modern society.

Graduate Profile	– A person with both a wide basic knowledge in science and geosciences and excellent expertise. – A person with an outstanding ability for area work or experiments/data analysis. – A person with problem-solving skills concerning geoscientific issues. – A person with foreign language and communication abilities that can be accepted in the society. – A person who understands the needs of society for geosciences, and has a basic knowledge and an ability to take actions which re immediate assets to firms etc. – A person with a high ethical perspective for research activities.

Diploma Policy

The degree of Master of Science 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
Knowledge and Skills	1. Knowledge application competence: Ability to contribute to society with advanced knowledge	①Can you apply knowledge gained through research and other activities in society? ②Can 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	①Can you take on major tasks with systematic planning? ②Can you understand and solve problems from multiple perspectives?
	3. Communication competence: Ability to accurately and clearly communicate expert knowledge	①Are you capable of efficient communication for research purposes? ②Can 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	①Do you have experience cooperatively and actively working on challenges as part of a team? ②Have you helped promote projects and activities other than your own research?
	5. Internationality competence: Willingness to contribute to international society	①Are you aware of making contributions to international society and getting involved in international activities? ②Have you obtained the linguistic skills necessary for international information collection and action?
	6. Knowledge and comprehensive ability: a wide knowledge and comprehensive ability related to science and geoscience.	①If having a wide knowledge related to science and geoscience. ②If understanding the basic principle behind various events related to science and geoscience.
	7. Planning ability: a planning ability to plan research tasks and carry out a research plan.	①If capable of setting the research tasks related to science and geoscience. ②If capable of drafting and carrying out a research plan related to science and geoscience.
	8. Problem-solving ability: an ability to tackle various issues and solve problems by understanding the basic principle behind it.	①If capable of recognizing various problems related to science and geoscience. ②If capable of solving various problems related to science and geoscience.

	Competences	Evaluation perspectives
Knowledge and Skills	9. Expressiveness: an ability to express themselves based on basic foreign language skills and communication skills.	①If having basic foreign language skills. ②If having communication skills to enable students to express the research outcomes relating to sciences and geoscience by themselves.
	10. Creativity: an ability to tackle various issues and apply the results obtained from the research.	①If capable of tackling various issues related to science and geoscience and achieving research outcomes. ②If having creativity to apply the research outcomes related to science and geoscience.
Guidelines for Assessing Learning Outcomes	The evaluation of learning outcomes is conducted through achievement-level assessments based on the "Achievement Assessment Rubric". At each of the following stages, the level of acquisition of competences stipulated in the Degree Award Policy is objectively verified and evaluated: – Semester-by-semester reviews of research progress conducted by the Advisory Committee – A midterm review conducted at the degree program – A research presentation session conducted at the degree program and the final review conducted by the Thesis Examination Committee	
Evaluation Criteria for Degree Theses/ Dissertations	The dissertation that satisfies all the following items shall be a pass as the thesis for master's degree after going through final examination. Additionally, the thesis shall be examined by the committee for master's thesis review (composed of one chief examiner and two or more sub examiners). While the instructor shall be the sub-examiner in charge of master's program in geoscience, the instructors in charge of other degree programs can participate in such examination. 1. If the submitted master's thesis is high in degree of completion including descriptions, logic expansion and charts. 2. If the level of the contents of master's thesis is high enough as the research in the area of geosciences. 3. If the references are appropriately cited for the master's thesis. 4. If contribution to the research contents of master's thesis by the applicant of master's degree has been sufficiently recognized. 5. If academic rank, contents and future developments of master's thesis are sufficiently understood. 6. If questions and answers are properly carried out in presentation.	

Curriculum Policy

In this Degree Program, subject to the students who have the knowledge to graduate from faculty/department, the curriculum shall be organized aiming at training the human resources that research the process and mechanism of various phenomena in global environment, or earth evolution from the birth of the Earth up to the present and have an ability to gain a comprehensive understanding from various aspects including human environment. For this purpose, this Degree Program is composed of necessary area of expertise (including cooperated graduate school). In all such areas, the curriculum has been organized in order to learn the specialized knowledge relating to specific area necessary to achieve the diploma policy mentioned above and acquire foreign language skills, communication skills, problem-solving ability, ethical view and a wide basic knowledge in the area of geosciences.

Curriculum Design Framework	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. – Regarding setting of course classification, the curriculum shall be divided into “Foundation Subjects for Major” and “Major Subjects”. “Foundation Subjects for Major” shall deal with the contents common to degree programs, and the basic knowledge relating to geosciences shall be acquired. In “Major Subjects”, specialized lectures/practical training in each area shall be provided, through whose completion specialized knowledge in specific research areas can be acquired. – The students aiming at acquisition of master's degree can receive highly intensive tutorial in a series of curricula until completion of the degree, by the advisory committee composed of the chief supervisor mainly in charge of research instruction and the sub supervisor(s) who cooperate(s) with such research instruction as advisor(s). – Through Foundation Subjects for Major, intellect utilization ability and the ability to have a wide vision shall be acquired. – Through area experiments, Management competence, Communication competence, Teamwork competences, research ability, problem-solving ability and ability to explore shall be acquired. – Through the courses related to foreign languages, Competence in Internationality and research ability shall be acquired. – Through special Topics/General Lectures in the area of expertise, research ability, problem-solving ability and ability to explore shall be acquired.

Curriculum Design Framework	– Through practical training courses, research ability, problem-solving ability, ability to explore, presentation/communication skills shall be acquired. – Through internship, Communication competence, Teamwork competences and the ability to have a wide vision shall be acquired. – Through special research and practical training, all of ten kinds of competences shall be acquired.
Teaching and Learning Methods	– In the 1st year, the Foundation Subjects for Major and the Major Subjects related to each area of expertise (special courses/comprehensive courses/practical training courses etc.) shall be taken. In the 2nd year, the Major Subjects related to each area of expertise shall be continuously taken. – As the selective courses, one or more credits shall be approved from Graduate General Education Courses, Inter-disciplinary Foundation Courses and Degree Programs' Common Courses. – Special Research I in the 1st year and Special Research II in the 2nd year shall be taken and the research toward creation of master's thesis shall be carried out. – Upon commencing the 1st 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 shall be provided to confirm registered courses and acquired credits etc. The advisory committee shall participate in other master' programs, as necessary.

Admission Policy

Desired Student Profile	In any of the area of expertise of geosciences, the desired student shall have basic specialized have the knowledge to graduate from faculty/department, motivation to deeply explore various natural phenomena on the earth both in the past and at present and have acquired interdisciplinary knowledge for their comprehensive settlement. Especially, the student who has a deep interest in scientifically observing and analyzing natural phenomena and lab tests/observation and field work such as area observation and survey shall be welcomed. It is required that the student shall be willing to study basic science steadily and endeavor to think logically from international vision.
Student Selection Process	– The basic knowledge and basic academic skills relating to geosciences shall be evaluated by document screening and written examination. – The motivation for research and ability to think logically shall be evaluated by oral examination.

Learning Support Framework

Academic Support	Through the advisory committee system, multiple faculty members provide complementary support for students' learning. In addition, financial support is provided through university-wide schemes or program-specific mechanisms to ensure that students can fully engage in their academic activities.

Opportunities for Peer Interaction	By actively promoting discussions and collaboration beyond individual laboratory boundaries at the academic field level, the program encourages interaction with faculty members other than the primary and secondary academic advisors. Opportunities for dialogue are also provided at the degree program level.
Opportunities for Student–Faculty Interaction	Each faculty member reviews their syllabus annually, renewing their awareness of the importance of educational quality. In addition, quality is assured through repeated checks at the degree program level. These efforts are particularly evident in the quality of master's theses, and improvement measures are considered through the thesis review process.

Approaches to Assuring and Enhancing Educational Quality

- The students' learning outcomes are evaluated at educational meetings, advisory committee se-ssions, and five annual research presentation meetings. Through these evaluations, the validity of the curriculum and the appropriateness of academic supervision are examined.
- A Faculty Development (FD) Committee on Academic Affairs has been established to ensure the quality of education by continuously reviewing and improving all educational activities, thereby strengthening the framework for achieving the objectives of the degree program.