Doctoral Program in Human Biology

■ Doctor of Philosophy in Human Biology

Program Educational Objectives

To foster individuals who understand the mechanisms of human life maintenance, adaptation, and inheritance, who have acquired multidisciplinary expertise and advanced research skills that can contribute to the resolution of global issues related to human health, and who have the qualities of top international leaders and highly skilled professionals who can lead the creation of a society where people can live their lives as best they can.

Graduate Profile	Doctoral students who complete this program will have the ability to identify issues, make breakthroughs (planning and logical persuasion), and complete tasks in order to form an international consensus to solve global issues. They will be able to lead internationally feasible solutions to global issues in industry and scientific administrative organizations, promote entrepreneurship in new industries necessary to solve problems, and become research/education/international coordinators who are eagerly awaited by university administrations.

Diploma Policy

The degree of Doctor of Philosophy in Human Biology 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
Knowledge and Skills	1. Knowledge creation competence: Ability to create new knowledge that can contribute to future society	①Are there any research findings that can be considered new knowledge? ②Can 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	①Can you make and implement long-term plans for critical challenges? ②Can 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	①Can 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? ②Do 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	①Can you set attractive and compelling goals? ②Are 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	①Do you have strong awareness and motivation to contribute to international society and international activities? ②Have you obtained adequate linguistic skills for international information collection and action?
	6. Professional skills: Academic skills in human biology necessary for solving global issues.	①Does the student have the knowledge and skills to establish an original research theme and obtain excellent research results in the field of human biology? ②In the field of human biology, can the student tackle new problems by making full use of multidisciplinary methodologies?

	Competences	Evaluation perspectives
Knowledge and Skills	7. Connoisseurship: Ability to independently discover issues that may lead to a paradigm shift.	①Can the student accurately grasp the essence of new and unknown issues that arise? ②Can the student propose solutions to problems based on flexible and multifaceted ideas, without being limited to conventional knowledge and skills?
	8. Breakthrough ability: Ability to solve problems with sincerity and diligence.	①Does the student have the firm will necessary to explore the nature of the unknown problem? ②Can the student formulate a plan for solving a problem and persistently carry it out with high motivation and a sense of ethics? ③ As a leader, can the student gather appropriate individuals and build a network to solve problems?
	9 Conclusion: Ability to disseminate the results of solutions to society and apply them to social contribution.	①Can the student summarize and present the results of his/her research in an academic paper? ②Can the student, with an understanding of social conventions and economic systems, turn his/her research results into intellectual property and apply them to the needs of society from an international and regional perspective?
Guidelines for Assessing Learning Outcomes	The competences specified in the Diploma Policy are assessed through the following direct evaluation methods: – Curriculum-based assessment: Faculty advisors and course instructors evaluate student performance throughout the program, based on outcomes embedded in required courses and other curricular components. – Portfolio assessment (GLidD): The program employs GLidD (Growth & Learning Identification powered by Instructional Design), a portfolio-based system enabling continuous, visualized monitoring and evaluation of competence attainment. – Qualifying Examination 1 (QE1): Administered by the end of the second year, conditional upon completion of at least 60 credits. Competence attainment is examined through document review, oral presentation, and oral examination. – Midterm dissertation presentation: Conducted in the fourth year to confirm attainment of the prescribed competence standards through document review, oral presentation, and oral examination. – Qualifying Examination 2 (QE2) and preliminary dissertation review: Administered in the fifth year, conditional upon completion of at least 72 credits. Competence attainment is examined through document review, oral presentation, and oral examination.	

Guidelines for Assessing Learning Outcomes	– Final dissertation review: Conducted in the fifth year to verify attainment of the competence standards required for degree conferral through document review, oral presentation, and oral examination.
Evaluation Criteria for Degree Theses/ Dissertations	Level standards required for the degree thesis The applicant must be recognized as having the ability to set up an original and outstanding theme in human biology, to obtain results appropriate for a doctoral degree, and to compile the results in an appropriate style. The applicant must also be recognized as having the ability to understand the needs of society in the field, to set up the necessary implementation objectives, to promote research and practice on his/her own, to summarize the results, and to publish academic papers that are highly evaluated internationally by industry or academia. The expert committee shall consist of one primary examiner and at least three secondary examiners. The primary examiner shall be appointed by the review committee from among the research advisors of the degree program, and the secondary examiners shall be appointed by the review committee from among the research advisors or course instructors of the degree program. The secondary examiners shall include the applicant's primary advisor, and in addition to faculty members of the degree program, faculty members of other academic institutions, university faculty members of other universities, or those recognized by the review committee as having equivalent or superior research achievements, and one faculty member from overseas or from industry who serves as a secondary advisor may be added. Review method and review items, etc Based on the dissertation, oral presentation and question-and-answer session. The examination items are as follows. (1) Human ability suitable for a top world leader capable of leading globally (2) Planning ability and originality (ability to explain the setting of the theme, significance of the plan, originality, feasibility, and expected results) (3) Results in practice (quality and quantity of research and activity results) (4) Project promotion ability (reliability of results, significance of results, understanding of results, planning) (5) Summary skills (ability to compose a proposal or academic paper by layering results, ability to create logical and persuasive documents, presentation skills)

Curriculum Policy

Understand the concept of human biology, acquire the expertise of epigenetic biomolecules science and its control technology that cannot be handled by conventional central dogmas centered on DNA analysis, and apply these findings to the field of society. The educational course for cultivating connoisseurs, breakthroughs, and completeness to be utilized to solve problems will be organized as follows.

Curriculum Design Framework	– Through the courses in “Basic Subjects”, students will acquire (1) a strong desire to play an active role in the world, (2) a sincere spirit, a sense of ethics, the ability to negotiate internationally, and the fundamentals of leadership and entrepreneurship, and (3) the ability to adapt to the environment and the practical ability to learn to navigate the globe, extracting problems to be solved from complex realities. – By taking the course in “Medical Subjects”, “Molecular Subjects”, and “Mathematics and Computational Science” belonging to “Basic Specialized Subjects”, students will acquire (1) knowledge of human biology at a level equivalent to that of Japanese physicians, (2) specialized knowledge of chemical substances and their research methods, and (3) exercises in computer-aided biological research. In this course, students will acquire computer-aided complex research methods for research on human subjects, where experimental research is limited. – Through the courses categorized in “Other Subjects” of “Basic Specialized Subjects, students will systematically learn about the latest achievements in human biology and research methods in the life sciences. – With the aim of improving each student's expertise through “Specialized Subjects”, students will deepen their specialized knowledge and skills in their chosen field, develop their research skills, and learn how to extrapolate the results of animal experiments to humans by introducing computational science. – In the third through fifth years, students develop their individuality and establish their own future career goals in the world. – In addition to the primary advisor, two or more secondary advisors, including one from overseas universities, industry, or independent research institutes, will be selected for specialized research through regular multi-teacher guidance using e-mail, the Internet, and other means of communication.

Teaching and Learning Methods	The standard course schedule is shown below. – By the end of the second year, students must earn 60 credits in required and elective courses and pass QE1. – In the first half of the fourth year, a midterm evaluation is conducted by the midterm evaluation committee, and students receive guidance on the preparation of their dissertations. – Students are eligible to submit a dissertation if they pass the midterm evaluation, earn 72 credits in required and elective courses, acquire a certain level of English proficiency (TOEIC 860 or higher, etc.), pass the QE2, publish (including in print) at least two original papers in English (one as the first author) in journals with an established review system and are certified as passing by the preliminary dissertation review committee established in the second half of the fifth year. – Upon submission of the dissertation, the dissertation review committee is established, and the dissertation review and final examination are conducted.

Admission Policy

Desired Student Profile	This degree program seeks individuals who have the ability to understand the mechanisms of maintenance, adaptation, and inheritance of human life, and who have the qualities to become global leaders in a wide range of industry, academia, and government.
Student Selection Process	We do not question the amount of knowledge that the applicant currently possesses, but rather evaluate the applicant's capabilities, specifically whether they can reason logically using the given environment and their current knowledge and skills, whether they can explain things to others in an easy-to-understand manner, whether they can understand others' explanations, and how the applicant deals with difficulties when they arise.

Learning Support Framework

Academic Support	The portfolio-based achievement assessment method GLidD (Growth & Learning identification powered by Instructional Design) enables students to reflect on their learning progress and clarify their objectives. It also allows academic advisors to monitor students' learning status and create opportunities to enhance support and guidance.
Opportunities for Peer Interaction	Through the tutor system, senior students provide essential support to new students, enhancing peer effects among students.
Opportunities for Student–Faculty Interaction	The co-academic advisor system promotes interaction between students and faculty, aiming to enhance learning motivation and the quality of research.

Approaches to Assuring and Enhancing Educational Quality

- Regarding the Admission Policy, Curriculum Policy, and Diploma Policy, the educational aims and objectives of the degree program are shared between students and faculty through orientation for students and faculty meetings and departmental faculty development sessions for faculty.
- Syllabi undergo systematic review and improvement with each update. Grading policies are reviewed and shared annually. Grade distribution is verified and improved based on these policies.
- Regular surveys are conducted for current students and graduates. Results are shared at faculty meetings and departmental faculty development sessions to enhance educational quality.
- After evaluating and compiling student learning outcomes at the Curriculum Committee and Degree Examination Committee, the compiled results are deliberated at the Steering Committee to verify the validity of the curriculum and the appropriateness of instruction.