Doctoral Program in Neuroscience

■ Doctor of Philosophy in Neuroscience

Program Educational Objectives

The program aims to cultivate researchers and highly skilled professionals in neuroscience who possess a broad and profound academic foundation in brain function, contribute to the understanding of the human mind as a higher brain function, and are sensitive and committed to addressing the complex issues related to the mind and behavior that society faces. These individuals are expected to have a strong sense of professionalism as experts in neuroscience, supported by rich personal qualities.

Graduate Profile	– Individuals who, grounded in an interdisciplinary understanding of neuroscience, can respond flexibly and responsibly to the complex issues related to the mind and behavior that modern society faces in diverse settings both domestically and internationally. – Individuals who, in domestic and international educational and research institutions, can take a leading role in human resource development and interdisciplinary research by upholding research ethics and demonstrating a sense of professionalism in neuroscience, strong self-management, and well-rounded personal qualities. – Individuals who possess the highest level of interdisciplinary knowledge on both normal and disordered brain functions and are capable of advancing both basic and applied research.

Diploma Policy

The degree of Doctor of Philosophy in Neuroscience 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. High level of expertise: Expertise in the neurosciences to develop and implement advanced research designs and produce superior research results	①Can the student identify new challenges based on expertise in the field of neuroscience? ②Can the student develop and implement a research plan to solve the problems found?

	Competences	Evaluation perspectives
Knowledge and Skills	7. Advanced research skills: Ability to conduct advanced research (experiments and surveys) in human and animal subjects in the field of neuroscience based on research ethics	Can the student use advanced research methods in the field of neuroscience to solve research problems?
	8. Research information gathering and dissemination skills: Ability to write, express, and debate in English appropriately to present and discuss research findings	①Can the student grasp the latest research trends in the field of neuroscience published in international journals and apply them to their own research? ②Can the student accurately explain their expertise and research results in the field of neuroscience based on logical thinking, in an international context?
Guidelines for Assessing Learning Outcomes	The assessment of learning outcomes is conducted by evaluating the extent to which competences, as defined in the degree conferment policy, have been achieved. This evaluation is carried out using the “Achievement Evaluation Table (Rubric)”. First Stage (End of the Autumn Semester of the Second Year): Regardless of the submission of QE3, all faculty members responsible for research supervision conduct an assessment based on the rubric at the Doctoral Dissertation Progress Report Meeting. Final Stage: At the Doctoral Dissertation Review Meeting, members of the Doctoral Dissertation Examination Committee who belong to the Neuroscience Degree Program conduct a rubric-based evaluation. Subsequently, the final achievement assessment is carried out by all faculty members at the Educational Council.	

Evaluation Criteria for Degree Theses/ Dissertations	Successful completion of Qualifying Examinations (QE) 1, 2, and 3 is required for submission of the doctoral dissertation. The dissertation must be judged as acceptable with the following two criteria confirmed by the final examination. 1. The dissertation must contain sufficient new academic knowledge in the field of neuroscience. 2. The applicant must have the high level of research skills necessary to work as an independent researcher in the field of neuroscience. (Evaluation items) 1. Based on understanding of research trend in and outside Japan preceding research in relevant area, the significance and positioning of the said research in neuroscience is clearly described. 2. Contain a reasonable amount of original research findings that contribute to the advancement of the field of neuroscience to be published in academic papers. 3. Reliability of research outcomes have been sufficiently verified based on sufficient knowledge regarding research integrity. 4. Consideration for the research outcomes is reasonable and their conclusions are based on objective grounds. 5. Background, purpose, method, results and conclusions etc. of the research shall be summarized in an appropriate form as doctoral dissertation in the area of neuroscience. Those who wish to apply for a dissertation review must pass a preliminary examination in their department. (System for examiner/examination method) The dissertation review committee consists of four members, including three faculty members from the degree program (the primary advisor is one of the research supervisors) and one faculty member from outside the degree program. All members attend the final examination, which consists of an oral examination on the dissertation and related fields, and pass/fail decisions are made.

Curriculum Policy

1) Research skills based on the mastery of specialized knowledge and research methods in all areas of neuroscience; 2) Logical thinking skills, writing skills, advanced English expression skills, debating skills; 3) Communication and planning skills required for collaboration with experts in other fields; 4) Understanding and practice of research ethics, self-management skills and research leadership skills as a researcher; 5) The Basic curriculum is designed to help students acquire the ability to disseminate the results of scientific research to society, and the awareness and the human skills to support them as professionals who are sensitive and sincere in dealing with the mental challenges that society faces.

Curriculum Design Framework	– In this course, the “Career Plan, Researcher Ethics, and TF Training Seminar” is a compulsory subject to develop a foundation for professional researchers and educators in neuroscience. In particular, students will be encouraged to clarify their career plans and strengthen their self-management skills through the use of MyIDP and other tools. – In addition, students are encouraged to take open-ended subjects such as the “Foundation Courses” (free choice of subjects), “Introduction to Academic Integrity” and “Applied Ethics” as common subjects for the graduate school, in order to cultivate a broader perspective and to cultivate flexible thinking and research planning skills that are not limited by existing academic systems. – Our department offers “Advanced Scientific Research Proposal in English” as a Foundation Subject for Major, and fosters advanced scientific English skills that will contribute to the writing of English papers and doctoral dissertations, as well as communication and debate at international conferences and in international collaborative research. – The “Advanced Neuroscience Seminar “ where students participate in research seminars held by internal and external research organizations, and the “Advanced Neuroscience Internship” where students are encouraged to participate in training courses offered by national and international educational and research institutions, to encourage the acquisition of cutting-edge techniques and knowledge that are essential for specialized research in neuroscience, and to give students hands-on experience of research activities in practical settings. – The students will develop their research leadership skills through TF experience as a review/ discussion of Introduction to Neuroscience, an introductory course in the Master's Program, an English Journal Club, and as a facilitator in an advanced neuroscience research seminar. – ” Neuroscience Dissertation Research” is offered in six compulsory courses to guide students through the process of deciding on a doctoral dissertation research topic, conducting research, three doctoral research qualifying exams, doctoral dissertation writing, doctoral dissertation final examinations, final public presentation of the doctoral dissertation, and obtaining the doctoral degree in a step-by-step manner, in order to ensure the quality and completion of degrees within the standard time frame.

Teaching and Learning Methods	Learning in the first year – Students are required to take the " Career Planning, Researcher Ethics, and TF Training Seminar" held immediately after enrollment and formulate their own academic and career plans up to and after the completion of the doctoral course. In addition to learning about researcher ethics, students will also attend a basic course on researcher ethics in order to be involved in teaching first semester courses as a TF. – Acquire a broad perspective as a researcher by taking "The Inter-disciplinary Foundation Courses (free choice of subjects). – Students will acquire advanced communication, debating, and reading skills in English, as well as specialized and advanced knowledge and research methods in neuroscience by taking compulsory courses in "Advanced Scientific Research Proposal in English 1" and "Advanced Neuroscience Seminar 1". Students also take "Advanced Neuroscience Internship" to gain research experience at universities and research institutions in Japan and abroad. – Students are required to take "Neuroscience Dissertation Research 1" to determine the theme of their doctoral research, conduct literature research and preliminary research. "Neuroscience Dissertation Research 2" is to advance doctoral research. At the same time, preparation for the Qualifying Examination for Doctoral Dissertation Research (QE1) will proceed. Learning after 2nd year – Students take compulsory courses in "Advanced Neuroscience Seminar 2", "Advanced Scientific Research Proposal in English 2", free courses in "Advanced Neuroscience Seminar 3", and courses in "Foundation Courses (free choice of courses)" and other degree programs to further their studies as neuroscientists. – Students are required to take "Neuroscience Dissertation Research 3" to advance their doctoral research. At the same time, prepare for the Qualifying Examination for Doctoral Dissertation 2 (QE2). During "Neuroscience Dissertation Research 4", students will do research for their doctoral dissertations. At the same time, students prepare for the Qualifying Examination for Doctoral Dissertation 3 (QE3) and prepare for submission to an international journal. – Students complete "Neuroscience Dissertation Research 5" and work on their doctoral dissertation. In "Neuroscience Dissertation Research 6", students complete their doctoral dissertation. At the same time, they prepare for the final doctoral examination and the final public presentation of the doctoral dissertation.

Admission Policy

Desired Student Profile	Applicants must have majored in neuroscience, psychology, disability science, biology, or basic medicine in the master's course. Applicants must have achieved a certain level of proficiency in the master's course and have the ability and desire to become independent researchers after completion of the course.

Student Selection Process	The entrance examination will be conducted through an oral examination. The following qualities will be emphasized in the selection process: (1) content and understanding of the research conducted in the master's course, (2) research planning ability, and (3) presentation ability.

Learning Support Framework

Academic Support	The program supports participation in training courses organized by the International Brain Research Organization (IBRO Schools) as well as the Neuroscience Summer Camp at National Taiwan University. These opportunities are designed not merely as venues for international exchange, but as platforms for building global research networks that will contribute to future scholarly activities. The Tri-Institutional Neuroscience Graduate Seminar (TiNGS), jointly organized by the University of Tsukuba, National Taiwan University, and Monash University Malaysia, is conducted online. Prior to presenting research abroad, students are provided with an international academic exchange setting in which they can challenge themselves in a familiar environment. As part of this initiative, they are given the opportunity to deliver concise three-minute flash talks in English. We require doctoral students to attend the Master's Thesis Research Qualification Examination (interim presentation) in the spring semester, as well as the proposal presentation and public presentation in the autumn semester. This requirement provides them with an opportunity to practice asking questions and giving comments.
Opportunities for Peer Interaction	The program actively encourages students to participate in the Gathering of the Graduate School of Comprehensive Human Sciences, thereby fostering interaction and exchange across academic years and disciplinary boundaries. The Master's Thesis Research Qualification Examination (interim presentation) in the spring semester, as well as the proposal presentation and public presentation in the autumn semester, are conducted in person. These occasions are designed to provide opportunities for mutual learning among students at all stages of both the Master's and Doctoral programs. Upon completion of overseas training or related activities, a public debriefing session is held, offering students an open forum for interaction and exchange with their peers.
Opportunities for Student–Faculty Interaction	We require the degree program's core faculty members and doctoral students to attend the Master's thesis proposal presentation, thereby creating a space for interaction between faculty and students. Similarly, debriefing sessions following overseas training and related activities are organized as venues for interaction and exchange between faculty and students.

Approaches to Assuring and Enhancing Educational Quality

In the first half of the academic year, activities from the previous year—such as a review of the degree conferment process and the career paths of program graduates—are examined. In the second half, activities from the spring semester—including student admissions and grade distributions in major courses—are reviewed. These evaluations are conducted through Faculty Development (FD) sessions with the participation of all members of the Educational Council.