

## Master's Program in Neuroscience

Name of the degree to be conferred	Master of Neuroscience
Educational purpose	To address various specific issues in society, such as aging, educational challenges, and mental health problems, this program aims to cultivate individuals who can apply their expertise in neuroscience, including knowledge of the human mind, behavior, brain functions, and related abnormalities, to contribute to solving problems, while demonstrating exceptional teamwork and communication skills. Additionally, this program seeks to develop individuals with advanced expertise and techniques grounded in a broad and profound academic foundation in neuroscience, equipping them with the international competitiveness required to pursue research training in the doctoral program.
Vision of human resources development	<ul style="list-style-type: none"> <li>• Individuals who, with an interdisciplinary understanding of neuroscience, possess the ability to address complex issues related to the mind and behavior that modern society faces, in various settings both domestically and internationally.</li> <li>• Individuals who can advance both basic and applied research by leveraging their academic foundation in normal and disordered brain functions.</li> </ul>
Diploma Policy	
The degree of Master of Neuroscience 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 competencies.	
Competencies	Evaluation perspectives
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. Basic knowledge/specialized knowledge: acquisition of fundamental knowledge that covers neuroscience in general essential to discover issues, draft plans and carry out research in the area of neuroscience	① If capable of discovering new issues based on fundamental knowledge in the area of neuroscience. ② If capable of drafting research plan to solve discovered issues.

7. Practical research skill: Ability to carry out basic research (experiment/survey) subject to human and animals in neuroscience area based on ethics of researchers	If capable of solving research tasks by making use of basic research method in the area of neuroscience.
8. Research information collection/ability to disseminate findings: communication skills including proficiency in foreign languages, sufficient for implementation for understanding of papers in the area of neuroscience, information collection and dissemination of findings	① If capable of understanding papers in the area of neuroscience published in international magazines and acquiring the latest findings therefrom. ② If capable of accurately and clearly explaining the contents of research and specialized knowledge, based on logical thinking, not only to those for different areas and not just one's own area.

#### Dissertation evaluation criteria

After satisfying the requirements prescribed in School Regulations of Tsukuba University, the doctoral thesis shall be approved as valid regarding the following evaluation items and judged as a pass in final examination.

(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. Right amount of original research outcomes that contribute to development of neuroscience is contained as master's thesis.
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 master's thesis of neuroscience.

(System for examiner/examination method)

The examination committee for master's thesis shall be composed of three faculty members (the primary advisor is one of the research supervisors), a pass or a failure shall be judged by implementing oral examination relating to the master's thesis and its relevant areas as a final examination at the presence of all examiners.

#### Curriculum Policy

The curriculum shall aim at having students acquire basic knowledge that cover neuroscience in general, research method, ability to think logically, ability to plan and implement research, ability to discover/solve problems, ability to coordinate with/manage different areas, communication skills/cooperativeness and ability to debate in English in cross-disciplinary way.

Curriculum organization policy	<ul style="list-style-type: none"> <li>• We offer the basic courses of "Introduction to Neuroscience" and "Neuroscience Laboratories" which consist of four sub-categories, i.e., "molecular/cellular", "systems", "behavior/cognitive" and "applied" neuroscience. With this course work the basis of all the areas of neuroscience can be systematically learned.</li> <li>• Through compulsory subjects of General Foundation Subjects ( "Neuroscience Professional Career Development" ) and Foundation Subjects for Major ( "Introduction to Neuroscience" , "Research Proposal Writing in English" ), basic research ability of neuroscience and scientific English communication skills shall be trained. Additionally, students shall be required to take Inter-disciplinary Foundation Courses and learn knowledge, way of thinking and approaches of neighboring areas.</li> <li>• In "Neuroscience Laboratories", students shall learn various research methods for neuroscience through hands-on practical training. In "English Journal Club", "Neuroscience Research Seminar", students shall independently learn a broad knowledge related to the trend of neuroscience research. Additionally, by establishing Translational Neuroscience Internship, opportunities shall be provided to experientially learn how the findings of basic research of neuroscience is applied to or utilized in the actual social spheres.</li> </ul>
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	<ul style="list-style-type: none"> <li>• By establishing four compulsory subjects as “Neuroscience Thesis Research” , and gradually providing instruction for the process from decision of theme for master’s thesis, research initiative presentation for master’s thesis, research qualification test for master’s thesis, final examination of master’ thesis, final public presentation of master’ thesis, to acquisition of master’s degree, quality of the master’s degree shall be assured.</li> </ul>
Learning methods • Processes	<p>Learning in the first year</p> <ul style="list-style-type: none"> <li>• Students shall take “Neuroscience Professional Career Development” and independently consider and establish leaning plan until acquisition of master’s degree and their career path after completion of master’s degree.</li> <li>• Students shall take “Research Ethics” and “ Inter-disciplinary Foundation Courses (subjects may be freely s)” and a broad education relating to ethical views as researcher and human science shall be acquired.</li> <li>• By completing all of “Introduction to Neuroscience A, B, C, D” (Principles of Neural Science, Fifth Edition 5<sup>th</sup> edition shall be planned for use as a textbook), basic knowledge shall be acquired relating to neuroscience at the levels of “molecular/cellular” , “systems” , “behavior/cognitive” and “applied”</li> <li>• Based on the lecture of Introduction to Neuroscience, one or more subjects from “Neuroscience Laboratories A, B, C, D” in any of the areas: “molecular/cellular” , “systems” , “behavior/cognitive” and “applied” , students shall practically learn basic research tasks and research method of each area.</li> <li>• By completing “Research Proposal Writing in English I” , and “English Journal Club I” , students shall independently learn communication skills in English, an ability to debate and an ability to read in English. Additionally, through research seminar by invited lecturers and informal discussion, students shall learn a fun of advanced research of a broad area of neuroscience.</li> <li>• In “Neuroscience Thesis Research I” , students shall search and learn the literature of previous research relating the theme of master’s thesis research.</li> <li>• In “Neuroscience Thesis Research II” , students shall advance research for master’s thesis by going through research initiative presentation for master’s thesis and advance preparations for research qualification test for master’s thesis in July in the second year.</li> <li>• According to students’ own career plan, by completing the subjects established by neuroscience master’s degree program such as “Research Proposal Writing in English II” , “English Journal Club 2” , “Neuroscience Advanced Research Seminar II” , “Translational Neuroscience Internship” etc., “ Inter-disciplinary Foundation Courses” and other master’s degree program, students shall acquire higher knowledge, research method, ability to logically think, English ability, and practical ability.</li> <li>• In “Neuroscience Thesis Research III” , students shall continue research for master’s thesis after passing research qualification test for master’s thesis. In “Neuroscience Thesis Research IV” , students shall advance preparation of master’s thesis and aim at passing final examination of master’ thesis.</li> </ul>
Evaluation of learning outcomes	<ul style="list-style-type: none"> <li>• The subjects other than “Neuroscience Thesis Research II to IV” shall be evaluated according to the evaluation method described in the syllabus.</li> <li>• “Neuroscience Thesis Research II to IV” shall be evaluated according to the following in addition to the scores by the academic advisor and the accreditation shall be conducted. <ol style="list-style-type: none"> <li>(1) “Neuroscience Thesis Research II” : initiative presentation for master’s thesis. Oral presentation regarding research tasks for master’s degree shall be performed in the presence of all the research supervisors.</li> <li>(2) “Neuroscience Thesis Research III” : research qualification test for master’s thesis.</li> <li>(3) “Neuroscience Thesis Research IV” : final examination for master’s thesis regarding master’s thesis submitted. Presentation and oral examination for research for master’s thesis shall be performed in the presence of all the research supervisors. Additionally, for the persons who pass the final examination, the final public presentation for master’s thesis shall be performed.</li> </ol> </li> </ul>

## Admission Policy

Desired students	The desired students shall have high interest in specialized research regarding comprehensive brain function and behavior, mind and mental disorder. It is desirable but not always essential that students have received undergraduate education, including neuroscience, psychology, disability science, biology and basic medicine.
Selection policy	The entrance examination shall be composed of written examination and oral examination, by which linguistic skill, knowledge of the area of expertise and motivation and qualification for learning shall be comprehensively evaluated.