Mahidol University
Institute of Molecular Biosciences

Program Specification
Doctor of Philosophy Program in Neuroscience
(International Program)
Revised Program in 2022

1. Program Title: Doctor of Philosophy Program in Neuroscience (International Program)

2. Name of the final award

Full Title: Doctor of Philosophy (Neuroscience)

Abbreviation: Ph.D. (Neuroscience)

3. Responsible Units

3.1 Awarding Institution: Faculty of Graduate Studies, Mahidol University

3.2 Teaching Institution: Institute of Molecular Biosciences, Mahidol University

4. Status of the Program and Program Accreditation

4.1 This program was revised in 2022

4.2 Starting in semester 1, academic year 2022 onwards

4.3 Curriculum screening committee approved the program in its meeting 17/2021 on July 19, 2021 and meeting 3/2022 on January 24, 2022

4.4 The Mahidol University Council approved the program in its meeting 584 on September 21, 2022

5. Philosophy of the Program

The philosophy of the curriculum is to produce doctoral graduates who achieve learning both in breadth and depth in neuroscience, possess research skills and experience to work globally, think analytically and synthesize new knowledge systematically, possess life-long learning skills, and apply neuroscience knowledge for the benefit of society and mankind.

6. Expected learning outcomes

Upon graduation, the graduates should be able to

6.1 Demonstrate ethical code of conduct, moral responsibility, and follow the ethical regulation in neuroscience research.

6.2 Possess depth and breadth knowledge, and capable of tracking the shifting trend in neuroscience.

6.3 Synthesize new neuroscientific knowledge and integrate knowledge to solve the neurological, behavioral, and mental health issues.

6.4 Perform effectively as a leader and member of the teamwork.

6.5 Demonstrate advanced transferable skills comprising the mathematical analytical thinking and information technology skills for research and communication at the international-level.

7. Qualifications of Prospective Students

7.1 Plan 1 Research Only; 1.1 For students with Master's Degree

7.1.1 Must hold a Master of Science degree in Neuroscience or related fields which has been accredited by the Office of the Higher Education Commission.

7.1.2 Must have a GPA of no less than 3.50

7.1.3 Must pass an English Proficiency test according to the requirement of the Faculty of Graduate Studies.

7.1.4 Must have at least 1 research publication as first or corresponding author, or at least accepted for publication, in a quality international peer-reviewed journal. Research article must not be part of the. applicant's own graduate studies.

7.1.5 Must have a research proposal to proceed toward graduation in the doctoral degree program in Neuroscience and a propose name of major advisor whom intends to do research with.

7.1.6 Applicants with other qualifications indicated in 2), 3) and 5) may be considered by the Program Director, Program Committee, and the Dean of Faculty of Graduate Studies.

7.2 Plan 2 Coursework and research; 2.1 For students with Master's Degree

7.2.1 Must hold a Master of Science degree in Neuroscience or related fields which has been accredited by the Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation.

7.2.2 Must have a GPA not less than 3.50

7.2.3 Must pass an English Proficiency test according to the requirement of the Faculty of Graduate Studies.

7.2.4 Applicants with other qualifications indicated in 2)-3) may be considered by the Program Director, Program committee, and the Dean of Faculty of Graduate Studies.

7.3 Plan 2 Coursework and research; 2.2 For students with Bachelor's Degree

7.3.1 Must hold a Bachelor of Science degree in medical science or related fields which has been accredited by the Office of the Higher Education Commission.

7.3.2 Must have a cumulative GPA of at least 3.50

7.3.3 Must pass an English Proficiency test according to the requirement of the Faculty of Graduate Studies.

7.3.4 Applicants with other qualifications indicated in 2)-3) may be considered by the Program Director, Program committee, and the Dean of Faculty of Graduate Studies.

8. Selection Process

8.1 Applicants must pass an English proficiency test (TOEFL/IELTS) as required by the Faculty of Graduate Studies.

8.2 Applicants who have qualified English score are selected for an interview conducted in English by the program's faculties. The interview examination considers the qualification of the applicants based on five criteria: Knowledge, Research skills, Responsibility, Attitude, and Personality.

8.3 Final judgment will be made under the consideration of the Administrative Program Committee in concurrence with the Dean of Faculty of Graduate Studies, Mahidol University.

9. Educational Management System

9.1 System: Two-semesters credit system. One academic Year consists of 2 regular semesters, each with not less than 15 weeks of study.

9.2 Summer Session: None

9.3 Credit Equivalence to Semester System: None

10. Curriculum and Instructors

10.1 Curriculum

10.1.1 Number of credits

Plan 1 Research only

Plan 1.1 For students with a Master's Degree with research experience. No course work is required, only conduct the dissertation for 48 credits.

Plan 2 Coursework and research

Plan 2.1 For students with a Master's Degree. Students are expected to undertake at least 12 credits of coursework and conduct a dissertation for 36 credits.

Plan 2.2 For students with a Bachelor's Degree. Students are expected to undertake at least 24 credits of coursework and conduct a dissertation for 48 credits.

10.1.2 Curriculum Structure

The curriculum structure is set in compliance with Announcement of Ministry of Education on the subject of Criteria and Standards of Graduate Studies B.E. 2558, Doctoral Degree, Plan 1 and Plan 2 as below:

Plan 1 Research only

Plan 1.1 For students with a Master's Degree with research experience. No coursework is required, only conduct the dissertation for 48 credits.

1) Dissertation	48 credits
Total not less than	48 credits

Note: Students may take seminar courses (MBNS 790, MBNS 794) upon the recommendation of the program committee. These courses are non-credit and will not count towards a requirement to complete the degree. Students must pass the assessment criteria of that course and it will grant only the "audit (AU)" grade.

Plan 2 Coursework and Dissertation

Plan 2.1 For students with a Master's Degree. Students are expected to undertake at least 12 credits of coursework and conduct a dissertation for 36 credits.

1) Prerequisite Course	Non-credit
2) Required courses	6 credits
3) Elective courses not less than	6 credits
4) Dissertation	36 credits
Total not less than	48 credits

Notes: Students without prior background knowledge in neuroscience must register the MBNS 610 Introductory Neuroscience as prerequisite course before starting the 1st semester. The prerequisite course is a non-credit course and will not count towards a requirement to complete the degree. Students must pass the assessment criteria of that course and it will grant only the "audit (AU)" grade.

Plan 2.2 For students with a Bachelor's Degree. Students are expected to undertake at least 24 credits of coursework and conduct a dissertation for 48 credits.

1) Required courses	18	credits
2) Elective courses not less than	6	credits
3) Dissertation	48	credits
Total not less than	72	credits

11. Courses in the curriculum

Plan 1.1 For students with a Master's Degree with research experience. No course work is required, only conduct the dissertation for 48 credits.

(1) Dissertation	Credits (lecture – practice – self-study)
MBNS 898 Dissertation ชมปว ๘๙๘ วิทยานิพนธ์	48(0-144-0)

Plan 2.1 For students with a Master's Degree. Students are expected to undertake at least 12 credits of coursework and conduct a dissertation for 36 credits.

(1) Prerequisite Course	Credits (lecture – practice – self-study)
MBNS 610 Introductory Neuroscience ชมปว ๖๑๐ ประสาทวิทยาศาสตร์เบื้องต้น	1(1-0-2)

Notes: Prerequisite course is required only for students without prior background knowledge in neuroscience. Students must register the MBNS 610 Introductory Neuroscience as prerequisite course before starting the 1st semester. The prerequisite course is a non-credit course and will not count towards a requirement to complete the degree. Students must pass the assessment criteria of that course and it will grant only the "audit (AU)" grade.

(2) Required Courses	Credits (lecture – practice – self-study)
MBNS 753 Clinical Neuroscience ชมปว ๗๕๓ ประสาทวิทยาศาสตร์ทางคลินิก	2(2-0-4)
MBNS 755 Advanced Neuroscience ชมปว ๗๕๕ ประสาทวิทยาศาสตร์ขั้นสูง	2(2-0-4)
MBNS 790 Doctoral Seminars in Neuroscience ชมปว ๗๙๐ สัมมนาทางประสาทวิทยาศาสตร์ระดับปริญญาเอก	1(1-0-2)
MBNS 794 Doctoral Seminars in Integrated Neuroscience ชมปว ๗๙๔ สัมมนาทางประสาทวิทยาศาสตร์บูรณาการระดับปริญญาเอก	1(1-0-2)

(3) Elective Courses	Credits (lecture – practice – self-study)
MBNS 751 Research Methods in Cellular and Molecular Neuroscience ชมปว ๗๕๑ วิธีวิจัยทางประสาทวิทยาศาสตร์ระดับเซลล์และโมเลกุล	2(1-2-3)
MBNS 752 Research Methods in Cognitive Neuroscience ชมปว ๗๕๒ วิธีวิจัยทางประสาทวิทยาศาสตร์การรู้คิด	2(1-2-3)
MBNS 754 Selected Topics in Contemporary Neuroscience ชมปว ๗๕๔ หัวข้อที่เลือกสรรทางประสาทวิทยาศาสตร์ร่วมสมัย	2(2-0-4)

MBNS 756 Behavioral and Cognitive Neuroscience 2(2-0-4)
ชมปว ๗๕๖ ประสาทวิทยาศาสตร์เชิงพฤติกรรมและการรู้คิด
*MBNS 757 Drug Development for Neurological Diseases 2(1-2-3)
ชมปว ๗๕๗ การพัฒนายาสำหรับโรคทางระบบประสาท

Notes: In addition to the elective courses mentioned above, a student may register other courses in international program offered by other faculties equivalent to graduate studies of Mahidol University, or the ones offered by other universities according to the student's interest with the approval of the curriculum committee or the advisor.

(4) Dissertation	**Credits (lecture – practice – self-study)**
MBNS 699 Dissertation ชมปว ๖๙๙ วิทยานิพนธ์	36(0-108-0)

Plan 2.2 For students with a Bachelor's Degree. Students are expected to undertake at least 24 credits of coursework and conduct a dissertation for 48 credits.

(1) Required Course	**Credits (lecture – practice – self-study)**
MBNS 600 Neurobiology ชมปว ๖๐๐ ประสาทชีววิทยา	3(2-2-5)
MBNS 603 Neuropsycho Pharmacology ชมปว ๖๐๓ เภสัชวิทยาจิตประสาท	2(2-0-4)
MBNS 604 Research Methodology and Techniques in Neuroscience ชมปว ๖๐๔ เทคนิคและวิทยาระเบียบวิธีวิจัยทางประสาทวิทยาศาสตร์	3(2-2-5)
MBNS 605 Neurochemistry ชมปว ๖๐๕ ประสาทเคมี	2(2-0-4)
MBNS 650 Developmental Neuroscience ชมปว ๖๕๐ ประสาทวิทยาศาสตร์เชิงพัฒนาการ	2(2-0-4)
MBNS 753 Clinical Neuroscience ชมปว ๗๕๓ ประสาทวิทยาศาสตร์ทางคลินิก	2(2-0-4)
MBNS 755 Advanced Neuroscience ชมปว ๗๕๕ ประสาทวิทยาศาสตร์ขั้นสูง	2(2-0-4)
MBNS 790 Doctoral Seminars in Neuroscience ชมปว ๗๙๐ สัมมนาทางประสาทวิทยาศาสตร์ระดับปริญญาเอก	1(1-0-2)
MBNS 794 Doctoral Seminars in Integrated Neuroscience ชมปว ๗๙๔ สัมมนาทางประสาทวิทยาศาสตร์บูรณาการระดับปริญญาเอก	1(1-0-2)

(2) Elective Courses	Credits (lecture – practice – self-study)
MBNS 606 Current Topics in Neuroscience	2(2-0-4)
ชมปว ๖๐๖ หัวข้อปัจจุบันทางประสาทวิทยาศาสตร์	
MBNS 651 Neuroendocrinology	2(2-0-4)
ชมปว ๖๕๑ ประสาทชีววิทยาของระบบต่อมไร้ท่อ	
MBNS 655 Pathogenesis of Neurological Diseases	2(2-0-4)
ชมปว ๖๕๕ พยาธิกำเนิดของโรคทางระบบประสาท	
MBNS 751 Research Methods in Cellular and Molecular Neuroscience	2(1-2-3)
ชมปว ๗๕๑ วิธีวิจัยทางประสาทวิทยาศาสตร์ระดับเซลล์และโมเลกุล	
MBNS 752 Research Methods in Cognitive Neuroscience	2(1-2-3)
ชมปว ๗๕๒ วิธีวิจัยทางประสาทวิทยาศาสตร์การรู้คิด	
MBNS 754 Selected Topics in Contemporary Neuroscience	2(2-0-4)
ชมปว ๗๕๔ หัวข้อที่เลือกสรรทางประสาทวิทยาศาสตร์ร่วมสมัย	
MBNS 756 Behavioral and Cognitive Neuroscience	2(2-0-4)
ชมปว ๗๕๖ ประสาทวิทยาศาสตร์เชิงพฤติกรรมและการรู้คิด	
*MBNS 757 Drug Development for Neurological Diseases	2(1-2-3)
ชมปว ๗๕๗ การพัฒนายาสำหรับโรคทางระบบประสาท	

*New courses

Notes: In addition to the elective courses mentioned above, a student may register other courses in international program offered by other faculties equivalent to graduate studies of Mahidol University, or the ones offered by other universities according to the student's interest with the approval of the curriculum committee or the advisor.

(3) Dissertation	Credits (lecture – practice – self-study)
MBNS 799 Dissertation	48(0-144-0)
ชมปว ๗๙๙ วิทยานิพนธ์	

12. Research Project of the Program

Guidelines for conducting a research project are as follows:

1) Neurobiology and factors-related neurodegenerative diseases and aging
2) Developmental neuroscience, fetal programming of neurodevelopmental and neuropsychiatric disorders
3) Neuroinflammation induced by toxic substances, brain injury, or stress environment: the implication on therapeutic intervention
4) Acute and chronic neurotoxicity and their effects on neuronal fates and animal behaviors
5) Factors modulating cognitive function and brain physiology by electroencephalography (EEG) methods
6) Neurobiology and clinical signs and symptoms of psychological disorders related to anatomical, physiological, and cellular and molecular perspectives
7) Molecular and physiological basis of cardiovascular diseases and neuronal injury
8) Factors modulating sleep and its underlying clock gene regulation
9) Structural biology of proteins related to neurological and neuropsychiatric disorders

13. Study Plan

13.1 Study Plan 1.1 For students with a Master's Degree with research experience. No course work is required, only conduct the dissertation for 48 credits.

Study Plan 1.1

Year	Semester 1	Semester 2
1	MBNS 898 Dissertation 8(0-24-0) (Qualifying Examination) **Total 8 credits**	MBNS 898 Dissertation 8(0-24-0) **Total 8 credits**
2	MBNS 898 Dissertation 8(0-24-0) **Total 8 credits**	MBNS 898 Dissertation 8(0-24-0) **Total 8 credits**
3	MBNS 898 Dissertation 8(0-24-0) **Total 8 credits**	MBNS 898 Dissertation 8(0-24-0) **Total 8 credits**

Notes:

1) Students are encouraged to attend the Ph.D. seminar to present their thesis progress report every semester.

2) Students complete the qualifying examination within 1st semester. Students must pass the qualifying examination before register the dissertation credits.

13.2 Study Plan 2.1 For students with a Master's Degree. Students are expected to undertake at least 12 credits of coursework and conduct a dissertation for 36 credits.

Study Plan 2.1

Year	Semester 1	Semester 2
MBNS 610 Introductory Neuroscience (Non-credit)		
1	MBNS 753 Clinical Neuroscience 2(2-0-4) MBNS 755 Advanced Neuroscience 2(2-0-4) MBNS 790 Doctoral Seminars in Neuroscience 1(1-0-2) Elective courses 4 credits **Total 9 credits**	MBNS 794 Doctoral Seminars in Integrated Neuroscience 1(1-0-2) Elective courses 2 credits MBNS 699 Dissertation 4(0-12-0) (Qualifying Examination) **Total 7 credits**
2	MBNS 699 Dissertation 8 (0-24-0) **Total 8 credits**	MBNS 699 Dissertation 8 (0-24-0) **Total 8 credits**
3	MBNS 699 Dissertation 8 (0-24-0) **Total 8 credits**	MBNS 699 Dissertation 8 (0-24-0) **Total 8 credits**

Notes:

1) Students without prior background knowledge in neuroscience must register the MBNS 610 Introductory Neuroscience as prerequisite course before starting the 1st semester of the first year. The prerequisite course will not count towards a requirement to complete the degree. Students must pass the assessment criteria of that course and it will grant only the "audit (AU)" grade.

2) Students must pass the qualifying examination before register the dissertation credits.

13.2 Study Plan 2.2 For students with a Bachelor's Degree. Students are expected to undertake at least 24 credits of coursework and conduct a dissertation for 48 credits.

Study Plan 2.2

Year	Semester 1	Semester 2
1	MBNS 600 Neurobiology 3(2-2-5) MBNS 605 Neurochemistry 2(2-0-4) Elective courses 4 credits	MBNS 603 Neuropsycho Pharmacology 2(2-0-4) MBNS 604 Research Methodology and Techniques in Neuroscience 3(2-2-5) MBNS 650 Developmental Neuroscience 2(2-0-4)

Year	Semester 1	Semester 2
		Elective courses 2 credits **Total 9 credits**
	Total 9 credits	
2	MBNS 753 Clinical Neuroscience 2(2-0-4) MBNS 755 Advanced Neuroscience 2(2-0-4) MBNS 790 Doctoral Seminars in Neuroscience 1(1-0-2) (Qualifying Examination) **Total 5 credits**	MBNS 794 Doctoral Seminars in Integrated Neuroscience 1(1-0-2) MBNS 799 Dissertation 8(0-24-0) **Total 9 credits**
3	MBNS 799 Dissertation 10 (0-30-0) **Total 10 credits**	MBNS 799 Dissertation 10 (0-30-0) **Total 10 credits**
4	MBNS 799 Dissertation 10 (0-30-0) **Total 10 credits**	MBNS 799 Dissertation 10 (0-30-0) **Total 10 credits**

Notes: Students must pass the qualifying examination before register the dissertation credits.

14. Graduation Requirement

14.1 Plan 1 Research Only

1. Total time of study should not exceed the study plan.

2. Student must conduct the dissertation for 48 credits and may study additional courses as recommended by the advisor, without credit count toward the requirement of the degree. The total number of credits required to complete the degree is not less than 48 credits.

3. Students must meet the English Proficiency Standard of the Graduate Students defined by the Faculty of Graduate Studies, Mahidol University.

4. Students must pass the Qualifying Examination following Regulations of Mahidol University on Graduate Studies.

5. Students must meet the requirement for soft skill development activities provided by the Faculty of Graduate Studies, Mahidol University.

6. Students must present their dissertation and deliver the final oral defense examination to the committee appointed by the Faculty of Graduate Studies, and receive a “PASS” result. The final oral examination must be open to public for attending and observing.

7. Whole or part of research must be published, or at least accepted for publication, in a quality international academic journal according to the regulation of the Office of the Higher Education Commission and the Faculty of Graduate Studies, Mahidol University, with at least 2 first authorship papers.

14.2 Plan 2 Courses work and Dissertation.

1. Total time of study should not exceed the study plan.

2. Must completed all courses work according to the study plan;

2.1 For students with a Master's degree, must study the courses work of not less than 12 credits and conduct the dissertation for 36 credits. The total number of credits required to complete the degree is not less than 48 credits.

2.2 For students with a Bachelor's degree, must study the courses work of not less than 24 credits and conduct the dissertation for 48 credits. The total number of credits required to complete the degree is not less than 72 credits.

3. Must have a cumulative GPA of not less than 3.00.

4. Students must meet the English Proficiency Standard of the Graduate Students defined by the Faculty of Graduate Studies, Mahidol University.

5. Students must pass the Qualifying Examination following Regulations of Mahidol University on Graduate Studies.

6. Students must meet the requirement for soft skill development activities provided by the Faculty of Graduate Studies, Mahidol University.

7. Students must present their dissertation and deliver the final oral defense examination to the committee appointed by the Faculty of Graduate Studies, and receive a “PASS” result. The final oral examination must be open to public for attending and observing.

8. Whole or part of research must be published, or at least accepted for publication, as first or corresponding author, in a quality international academic journal according to the regulation of the Office of the Higher Education Commission and the Faculty of Graduate Studies, Mahidol University.