Mahidol University
Institute of Molecular Biosciences

Program Specification

Master of Science Program in Neuroscience

(International Program)

Revised Program in 2022

1. Program Title Master of Science Program in Neuroscience (International Program)

2. Name of the final award

Full Title : Master of Science (Neuroscience)

Abbreviation : M.Sc. (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 Master Degree Program in Neuroscience is to generate qualified neuroscientists and experts in the field of brain sciences to serve the public and private sectors of Thai society. Compared with the

developed countries, Thailand has only a few postgraduate programs in Neuroscience despite an increasing need for neuroscience specialists. This Master Degree Program in Neuroscience is therefore opened to educate enrolled students to have strong knowledge and skills in neuroscience-related research.

6. Expected learning outcomes

Upon graduation, the graduates should be able to

6.1 Comprehend an appropriate ethical code of conduct, moral responsibility, and academic regulation in scientific experimentation.

6.2 Understand the neuroscience aspect of human behavior and mental health.

6.3 Apply neuroscientific knowledge and integrate knowledge to solve new scientific problems.

6.4 Implement leadership skills and be capable of working collaboratively with members as a team.

6.5 Demonstrate effective transferable skills including basic statistical analysis, communication, information technology for searching, processing, compiling, analyzing, and presenting data.

7. Qualifications of Prospective Students

7.1 Hold a Bachelor of Science degree in medical science or related fields, which accredited by the Office of the Permanent Secretary, Ministry of Higher Education, Science, Research and Innovation.

7.2 Have a cumulative GPA not less than 2.50

7.3 Pass an English Proficiency test according to the requirement of the Faculty of Graduate Studies

7.4 Applicants with other qualifications indicated from 2-3 may be considered by the Program Director, 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 Semester Credit system. 1 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 (not less than) 36 credits

10.1.2 Curriculum Structure

The curriculum structure is set in compliance with the Announcement of Ministry of Education on the subject of Criteria and Standards of Graduate Studies B.E. 2558, Master Degree, Plan A2 as below:

1) Prerequisite Courses	Non credit (audit)
2) Required courses	19 credits
3) Elective courses not less than	5 credits
4) Thesis	12 credits
Total not less than	**36 credits**

11. Courses in the curriculum

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

ชมปว ๖๑๐ ประสาทวิทยาศาสตร์เบื้องต้น#

MBNS 610 Introductory Neuroscience prerequisite course is required only for students without prior knowledge of neuroscience, or with a consent of faculty, to register before starting the 1st semester of the 1st academic year. The prerequisite course is a non-credit and will not count towards a requirement to complete the degree, and grant only “audit (AU)” grade for students who pass this course.

(2) Required Courses	Credits (lecture – practice – self-study)
SCID 500 Cell & Molecular Biology	3(3-0-6)
วทคร ๕๐๐ ชีววิทยาระดับเซลล์และโมเลกุล	
MBNS 600 Neurobiology	3(2-2-5)
ชมปว ๖๐๐ ประสาทชีววิทยา	
MBNS 603 Neuropsycho Pharmacology	2(2-0-4)
ชมปว ๖๐๓ เภสัชวิทยาจิตประสาท	
MBNS 604 Research Methodology and Techniques in Neuroscience	3(2-2-5)
ชมปว ๖๐๔ เทคนิคและวิทยาระเบียบวิธีวิจัยทางประสาทวิทยาศาสตร์	
MBNS 605 Neurochemistry	2(2-0-4)
ชมปว ๖๐๕ ประสาทเคมี	
* MBNS 608 Laboratory Rotation Training in Neuroscience	2(0-4-2)
ชมปว ๖๐๘ หมุนเวียนฝึกงานในห้องปฏิบัติการทางประสาทวิทยาศาสตร์	
MBNS 650 Developmental Neuroscience	2(2-0-4)
ชมปว ๖๕๐ ประสาทวิทยาศาสตร์เชิงพัฒนาการ	
MBNS 691 Seminars in Neuroscience	1(1-0-2)
ชมปว ๖๙๑ สัมมนาทางประสาทวิทยาศาสตร์	
MBNS 695 Seminars in Current Research in Neuroscience	1(1-0-2)
ชมปว ๖๙๕ สัมมนาในการวิจัยปัจจุบันทางประสาทวิทยาศาสตร์	

(3) Elective Courses	Credits (lecture – practice – self-study)
MBNS 606 Current Topics in Neuroscience	2(2-0-4)
ชมปว ๖๐๖ หัวข้อปัจจุบันทางประสาทวิทยาศาสตร์	
* MBNS 658 Animal Experimentation in Neuroscience	1(0-2-1)
ชมปว ๖๕๘ การทดลองโดยใช้สัตว์ทดลองทางประสาทวิทยาศาสตร์	
* MBNS 659 Microtechniques in Neuroscience Research	1(0-2-1)
ชมปว ๖๕๙ ไมโครเทคนิคทางการวิจัยประสาทวิทยาศาสตร์	

MBNS 651 Neuroendocrinology 2(2-0-4)

ชมปว ๖๕๑ ประสาทชีววิทยาของระบบต่อมไร้ท่อ

MBNS 655 Pathogenesis of Neurological Diseases 2(2-0-4)

ชมปว ๖๕๕ พยาธิกำเนิดของโรคทางระบบประสาท

In addition to elective courses mentioned above, a student may register for other courses in the international program offered by other faculties equivalent to graduate studies, 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) Thesis	**Credits (lecture – practice – self-study)**
MBNS 698 Thesis	12(0-36-0)
ชมปว ๖๙๘ วิทยานิพนธ์	

12. Research Project of the Program

Guidelines for conducting a research project are as follows:

1) Neurobiology and factor-related neurodegenerative diseases and aging
2) Developmental neuroscience, fetal programming of neurodevelopmental disorders and neuropsychiatric disorders
3) Neuroinflammation induced by toxic substances, brain injury or stress environment: the implication on the 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

Year	Semester 1	Semester 2
MBNS 610 Introductory Neuroscience (Non-credit)		
1	SCID 500 Cell & Mol Biology 3(3-0-6) MBNS 600 Neurobiology 3(2-2-5) MBNS 605 Neurochemistry 2(2-0-4) Elective 4 credits **Total 12 credits**	MBNS 603 Neuropsycho Pharmacology 2(2-0-4) MBNS 650 Developmental Neuroscience 2(2-0-4) MBNS 604 Research Methodology and Techniques in Neuroscience 3(2-2-5) MBNS 608 Laboratory Rotation Training in Neuroscience 2(0-4-2) Elective 1 credits **Total 10 credits**
Year	**Semester 1**	**Semester 2**
2	MBNS 691 Seminar in Neuroscience 1(1-0-2) MBNS 698 Thesis 8(0-24-0) **Total 9 credits**	MBNS 695 Seminars in Current Research in Neuroscience 1(1-0-2) MBNS 698 Thesis 4(0-12-0) **Total 5 credits**

14. Graduation Requirement

1. The study is accomplished followed the study plan

2. Students must complete courses as stated in the curriculum at least 24 credits and thesis 12 credits, in total 36 credits with a cumulative grade point average (CUM-GPA) at a minimum of 3.00.

3. Students must meet the English Competence Standard of Graduate Students, Mahidol University

4. Students must participate in professional and personal skills development activities, required by the Graduate Studies, Mahidol University.

5. Students must present the thesis and deliver the final oral defense to the Committee, appointed by the Faculty of Graduate Studies, and receive a “PASS”. The final oral defense shall be open to the community.

6. Students must submit the final version of the thesis document following the Guidelines for the Submission and Format of Thesis by the Faculty of Graduate Studies.

7. The thesis or a part of the thesis are required to publish or accepted for publication in the national or international academic journal according to the regulation of the Thai Commission of Higher Education, or publish in the proceedings that are listed by the Faculty of Graduate Studies, Mahidol University.