

Course Syllabus
MBNS 605 Neurochemistry
Academic Year 2024

Course ID and Name: MBNS 605 Neurochemistry
Course coordinator: Prof. Banthit Chetsawang, Ph.D.
Tel: 02-441-9003-7 ext. 1206
Email: banthit.che@mahidol.ac.th

Instructors:

1. Prof. Piyarat Govitrapong, Ph.D. (piyarat.gov@mahidol.ac.th, piyarat@cgi.ac.th)
2. Prof. Banthit Chetsawang, Ph.D. (banthit.che@mahidol.ac.th)
3. Assoc. Prof. Wipawan Thangnipon, Ph.D. (wipawan.tha@mahidol.ac.th)
4. Assoc. Prof. Nuanchan Chutabhakdikul, Ph.D (nuanchan.chu@mahidol.ac.th)
5. Assoc. Prof. Sujira Mukda, Ph.D. (sujira.muk@mahidol.ac.th)
6. Assist. Prof. Narisorn Kitiyanant, DVM., Ph.D. (narisorn.kit@mahidol.ac.th)
7. Lect. Jiraporn Panmanee, Ph.D. (jiraporn.pam@mahidol.ac.th)
8. Lect. Sirapapa Boobphahom, Ph.D. (s.boobphahom@gmail.com)
9. Lect. Dr. Ekkaphot Khongkla, Ph.D. (ekkaphot.kho@mahidol.edu)

Supporting Staff:

1. Somsong Phengsukdaeng (somsong.phe@mahidol.edu)

Credits: 2 (2-0-4)

Curriculum: Master of Science Program in Neuroscience (core course)
Doctor of Philosophy Program in Neuroscience (core course for B.Sc. Graduates)

Semester offering: First semester

Pre-requisites: -

Course learning outcomes (CLOs)

Upon completion of this course, students should be able to:

1. Understand chemical neurotransmitters, presynaptic proteins and cell adhesion molecules, chemically mediated synaptic transmission, neurotransmitter receptors, receptor-activated phosphoinositide

- turnover, G-proteins, cyclic nucleotides, and phosphorylation in the regulation of neuronal signaling functions. (PLO2-R)
2. Explain the principles and concepts of the chemical and functional organization of the nervous system at the cellular and molecular levels. (PLO3-R)
 3. Demonstrate an understanding of essential knowledge acquired for further approaches relevant to neurochemical research. (PLO1-I, PLO4-R, PLO5-R)

Alignment of teaching and assessment methods to course learning outcome:

Course learning outcome	Teaching method	Assessment method
1. Understand chemical neurotransmitters, presynaptic proteins and cell adhesion molecules, chemically mediated synaptic transmission, neurotransmitter receptors, receptor-activated phosphoinositide turnover, G-proteins, cyclic nucleotides, and phosphorylation in regulation of neuronal signaling functions.	(1) Lecture	(1) Quiz (2) Written examination
2. Explain the principles and concepts of the chemical and functional organization of the nervous system at the cellular and molecular levels.	(1) Lecture	(1) Quiz (2) Written examination
3. Demonstrate an understanding of essential knowledge acquired for further approaches relevant to neurochemical research	(1) Group discussion	(1) Participation

Course description:

The course emphasizes on principles of chemical transmission; second messenger; signaling transduction; neurotransmitters; neurotransmitter receptors; nuclear hormone receptor signaling; advances in neuronal stem cell research and molecular biology.

Course schedule:

Date: Monday, Wednesday and Friday

Time: 10.00 am. – 12.00 pm. and 13.00 pm. – 15.00 pm.

Rooms: Class activity will be held onsite at Room A107, Molecular Biosciences (MB) Building, Mahidol University, Salaya, Nakhon Pathom.**MAP-C:** online platform through Zoom Meeting<https://zoom.us/j/>

Meeting ID:

Passcode:

Topics	Date	Time	Lecture topics	Instructors
1.	Sep 16, 2024	09.30-10.00	Orientation	Banthit
		10.00-12.00	Chemical neurotransmission and signal transduction	Siraprapa
13.00-15.00		Synaptic, presynaptic proteins and cell adhesion molecule	Nuanchan	
2.	Sep 18, 2024	10.00-12.00	Acetylcholine	Nuanchan
3.		13.00-15.00	Serotonin, histamine and melatonin	Banthit
4.	Sep 20, 2024	10.00-12.00	Catecholamine	Piyarat Online
5.		13.00-15.00	Amino acid neurotransmitters	Banthit
6.	Sep 23, 2024	10.00-12.00	Neuropeptide	Piyarat Online
7.		13.00-15.00	Atypical neurotransmitters	Sujira
8.	Sep 25, 2024	10.00-12.00	Neurochemistry of learning and memory	Wipawan Online
Exam I	Sep 30, 2024	09.00-16.00	Exam 1 (Topics 1-8)	Somsong
9.	Oct 2, 2024	10.00-12.00	Neural stem cells	Wipawan Online
10.		13.00-15.00	Nuclear hormone receptor signaling	Nuanchan Online
11.	Oct 4, 2024	13.00-15.00	Recombinant DNA and protein technology	Jiraporn
12.	Oct 7, 2024	10.00-12.00	Neurochemical regulation of gene expression	Ekkaphot
13.		13.00-15.00	Transgenic animal	Narisorn
14.	Oct 11, 2024	09.00-16.00	Examination II (Topics 9-14)	Somsong
Exam II	Oct 15, 2024	09.00-12.00	Group discussion on integrated neurochemistry research topics	Lecture team

Assessment criteria:

Assessment criteria	Assessment method	Scoring rubrics
Quiz and Written examination (50%)	Short essay questions or multiple-choice questions	Scoring directly from correct answers and keywords.
Group discussion on assigned topic (30%)	Direct observation	observation of class participation (e.g., discussion, asking the question)
Participation in in-class activities (10%)	Direct observation	observation of class participation (e.g., discussion, asking the question)
Class attendance (10%)	Number of class attendance	Scoring directly from signing in each class

Student's achievement will be graded using symbols: A, B+, B, C+, C, D+, D, and F based on the distribution of student scores from the whole course as follows:

Percentage	Grade
85 -100	A
80 – 84	B+
70 - 79	B
60 - 69	C+
50 - 59	C
45 - 49	D+
40 – 44	D
< 40	F

Notice:

1. Since this is a core requirement course, students who receive a final grade below “B” will need to re-enroll in it in the next academic year.
2. According to the Faculty of Graduate Studies regulation, enrolled students must attend classes for over 80% of the total class time. Therefore, students who fail to comply with this regulation will be disqualified from the examination.

Updated: July 24, 2024