Course Syllabus

MBMB 638 Fundamental Neuroscience

Academic Year 2-2025

Course ID and Title: MBMB 638 Fundamental Neuroscience

Course Coordinator: Asst. Prof. Dr. Jiraporn Panmanee, Ph.D.

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Instructor:

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Support Staff:

Mr. Prapan Premsawat

Credits: 1(1-0-2)

Curriculum: Master of Science Program in Molecular and Integative Biosciences (Elective course)

Doctor of Philosophy Program in Molecular and Integative Biosciences (Elective course)

Semester: 2nd Semester

Pre-Requisites:

None.

Course Learning Outcomes (CLOs):

By the end of the course, student should be able to:

1. Demonstrate honesty, punctuality, responsibility, and follow the institute regulation (PLO3)
2. Understand the fundamental concepts of neuroscience and the structure and organization of the nervous system. (PLO1)
3. Explain the concept of neural communication, signal transmission and cognitive processes (PLO1)
4. Apply information technology and interpersonal communication skills through discussion and group presentation of interesting topics in the field of neurobiology (PLO1 PLO2 PLO4)

Alignment of Teaching and Assessment Methods to Course Learning Outcomes:

Course Learning Outcomes	Teaching Method	Assessment Method
1. Demonstrate honesty, punctuality, responsibility, and follow the institute regulation (PLO3)	1. Lecture 2. Class Discussion	1. Attendance (presence, absence, on-time) 2. Task submission (on-time) 3. Lab report writing (plagiarism)
2. Understand the fundamental concepts of neuroscience and the structure and organization of the nervous system. (PLO1)	1. Lecture 2. Class Discussion	1. Q&A during lecture 2. Discussion performance 3. Quiz / short exercise 4. Assignment
3. Explain the concept of neural communication, signal transmission and cognitive processes (PLO1)	1. Lecture 2. Class Discussion 3. Assignment	1. Discussion performance 2. Report writing performance 3. Quiz / short exercise 4. Assignment
4. Apply information technology and interpersonal communication skills through discussion and group presentation of interesting topics in the field of neurobiology (PLO1 PLO2 PLO4)	1. Group discussion and individual assignment 2. Class Discussion	1. Discussion performance 2. Presentation performance (lecture and lab session)

Course Description:

This course provides an introduction to the fundamental principles of neuroscience, exploring the structure and function of the nervous system, neural communication, sensory and motor systems, and basic cognitive processes.

Course Schedule:

(Classroom XXX)

	Activities	Description	Time	Instructors and Assistants
DAY1 Monday, Mar 09, 2025				
1	**Lecture/Active Discussion:** Introduction to Neuroscience and the Nervous System	To go over the concept, organization and function of neuroscience and the human nervous system	9:30 – 10:30 AM	**Banthit**
2	**Lecture/ Active Discussion:** Neurons and Neural Communication	To learn how our neuron communicates and works (different types of neurons and synapses)	11:00 – 12:00 AM	**Jiraporn**
3	**Lecture/ Active Discussion:** Synaptic Transmission and Neurotransmitters	To understand deeper about the chemicals underlying neural communications (neurotransmitter signaling)	13:00 – 14:00 PM	**Siraprapa**
4	**Lecture/ Active Discussion:** Central Nervous System and Peripheral Nervous System	To learn about the brain and spinal cord of CNS and the cranial and spinal nerves of PNS	14:30 – 15:30 PM	**Narisorn**
DAY2 Tuesday, Mar 10, 2025				
5	**Lecture/ Active Discussion:** Sensory Systems: Special senses (Taste, Smell, and Audition)	To understand how the special senses (taste, smell, and audition) works	9:30 – 10:30 AM	**Sujira**
6	**Lecture/ Active Discussion:** Sensory Systems: Somatosensation and vision	To understand how the somatosensation and vision works	11:00 – 12:00 AM	**Banthit**

	Activities	Description	Time	Instructors and Assistants
7	**Lecture/ Active Discussion:** Motor Systems and Movement	To understand how our motor system organizes and works	13:00 – 15:00 PM	**Narisorn**
DAY3 Wednesday, Mar 11, 2025				
8	**Lecture/ Active Discussion:** Learning and Memory	To learn about the process and brain regions involved in learning and memory	9:30 – 11:30 AM	**Jiraporn**
9	**Lecture/ Active Discussion: Cognitive Processes:** Attention and Perception	To learn about the cognitive process and brain regions involved in attention and perception process	13:00 – 15:00 PM	**Vorasith**
DAY4 Thursday, Mar 12, 2025				
10	**Lecture/ Active Discussion:** Brain Development and Plasticity	To go over about brain development and neural plasticity	9:30 – 11:30 AM	**Narisorn**
11	**Lecture/ Active Discussion:** Neurological Disorders and Their Impact	To study about several neurological disorders: brain pathology and therapeutic approaches	13:00 – 15:00 PM	**Vorasith**
DAY5 Friday, Mar 13, 2025				
12	**Written examination/ Take-home assignment/ open-book examination**	To assess student performance and understanding of the course objectives	9:00 AM – 12:00 PM	**Prapan/Jiraporn**
13	**Student Presentation/Discussion**	To assess student performance on selected topics in fundamental neuroscience	13:30 AM – 15:30 PM	**Teaching staff**
14	**Student's Reflection**	To provide students opportunities to describe their learning experiences received from this course and how it can be applied to their future learning.	15:30 – 16:00 PM	**Jiraporn**
15	**After Action Review**	To collect comments, suggestions from students for further improvements of the course.	16:00-16:30 PM	**Jiraporn**

Assessment Criteria:

Assessment Criteria		Description (in Details)	Scoring Rubric
1	**Participation and Attendance: 10%**	Showing up in the class (**5%**)	• Full attendance (**4**) • ~ 80% attendance (**3**) • ~ 60% attendance (**2**) • < 50% attendance (**1**)
2	**Assignments: 40%**	The presence of intro, methods, results, discussion, and conclusion **with no plagiarism** (**5%**)	• Complete (**4**) • ~ 80% complete (**3**) • ~ 60% complete (**2**) • < 50% complete (**1**)
		Data presentation (10**%**)	• Complete (**4**) • ~ 80% complete (**3**) • ~ 60% complete (**2**) • < 50% complete (**1**)
		Data analysis and interpretation (15**%**)	• Excellent (**4**) • Good (**3**) • Fair (**2**) • Need to be improved (**1**)
		English and writing skills (**5%**)	• Excellent (**4**) • Good (**3**) • Fair (**2**) • Need to be improved (**1**)
		Report format and typing errors (**2%**)	• Excellent (**4**) • Good (**3**) • Fair (**2**) • Need to be improved (**1**)
		On-time submission (**3%**)	• On-time (**4**) • Late (2-3) • Very late (1)

Assessment Criteria		Description (in Details)	Scoring Rubric
3	**Quizzes and Exams: 40%**	Depending on the correctness and completion (40%)	**Raw scores will be adjusted to be in a range of 0-40%**
4	**Presentation: 10%**	Participation and performance (3%)	• Active (**4**) • Fairly active (**2-3**) • Inactive (**1**)
		Professional and interpersonal skills (responsibility, teamwork, and leadership) (3%)	• Active (**4**) • Fairly active (**2-3**) • Inactive (**1**)
		Creative and high-order thinking skills (4%)	• Highly expressed (**4**) • Fairly expressed (**2-3**) • Not shown (**1**)

Student's achievement will be graded using symbols: A, B+, B, C+, C, D+, D and F, based on the criteria as follows:

Percentage	Grade	Description
80–100	A	Excellent
75–79	B+	Very Good
70–74	B	Good
65–69	C+	Fairly Good
60–64	C	Fair
55–59	D+	Poor
50–54	D	Very Poor
0–49	F	Fail

Date of Revision: 29 Nov 2025