

Course Syllabus
MBNS 600 Neurobiology
Academic Year 2023

Course ID and Name: MBNS 600 Neurobiology

Course coordinator: Jiraporn Panmanee, Ph.D.

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Instructors:

1. Prof. Banthit Chetsawang, Ph.D.
2. Assoc. Prof. Nuanchan Chutabhakdikul, Ph.D.
3. Assoc. Prof. Sujira Mukda, Ph.D.
4. Asst. Prof. Sukonthar Ngampramuan, Ph.D.
5. Asst. Prof. Narisorn Kittiyant, Ph.D.
6. Lecturer Jiraporn Panmanee, Ph.D.
7. Lecturer Anuck Sawangjit, Ph.D.

Supporting Staff:

1. Kanda Putthaphongpheuk
2. Somsong Phengsukdaeng
3. Sasithorn Prommet
4. Kornkanok Promthep

Credits: 3 (2-2-5)

Curriculum: Master of Science Program in Neuroscience (required course)

Doctor of Philosophy Program in Neuroscience (required course for B.Sc. Graduates)

Semester offering: Second semester

Pre-requisites: None

Course learning outcomes (CLOs)

Upon completion of this course, students are able to:

1. Understand moral responsibility in neurobiology research and follow the ethical code of conduct. (PLO1) |
2. Understand the fundamental concepts on the cellular and anatomical organization of the human nervous system. (PLO2) |

3. Analyze the theoretical knowledge and experimental approaches in the understanding of the neurophysiological processes of neurons and glial cells contributed to sensory perception, neural control of behaviors, and cognitive functions of the human brain. (PLO3) |
4. Apply information technology and interpersonal communication skills through discussion of interesting topics in the field of neurobiology. (PLO4) | (PLO5) |

Alignment of teaching and assessment methods to course learning outcome:

Course learning outcome	Teaching method	Assessment method
1. Understand moral responsibility in neurobiology research and follow the ethical code of conduct.	<ol style="list-style-type: none"> (1) Describe and demonstrate the morality, ethics, and ethical code of conduct for researchers. (2) Demonstrate appropriate methods for citing references, non-plagiarism with case studies and assignments. (3) Assign tasks, data collection and presentation with emphasis on honesty. 	<ol style="list-style-type: none"> (1) Evaluation from evaluating non-plagiarism scores in report submission. (2) Evaluation from group activities, student punctuality and honesty.
2. Understand the fundamental concepts on the cellular and anatomical organization of the human nervous system.	<ol style="list-style-type: none"> (1) Lecture (2) Laboratory practice by observation of brain specimens, microscopic slides, and diagrams. (3) In-class discussion 	<ol style="list-style-type: none"> (1) Written examination (2) Laboratory examination (3) Oral comprehensive examination
3. Analyze the theoretical knowledge and experimental approaches in the understanding of the neurophysiological processes of neurons and glial cells contributed to	<ol style="list-style-type: none"> (1) Lecture (2) Laboratory practice by observation of brain specimens, microscopic slides, and diagrams. (3) In-class discussion 	<ol style="list-style-type: none"> (1) Written examination (2) Laboratory examination (3) Oral comprehensive examination

<p>sensory perception, neural control of behaviors, and cognitive functions of the human brain.</p>		
<p>4. Apply information technology and interpersonal communication skills through discussion of interesting topics in the field of neurobiology.</p>	<p>(1) Group discussion and individual assignment</p>	<p>(1) Evaluation from academic presentation with suitable use of information technology, mathematical and statistical analyses in assigned topic (2) Evaluation from direct observation during group activity.</p>

Course description:

This course focuses on fundamental theories and laboratory practice on the human nervous system including the organization of the nervous system, the relationship between the brain, mind and behavior, the concept of chemical neurotransmission and neurotransmitters, evolution of the neural circuitry from animals to humans, development of the nervous system and anatomical and functional studies of each brain region.

Course schedule:

Date: Monday, Wednesday, and Friday

Time: 09.00-16.00

Venue: Lecture: Onsite (Student enrolled in the program)/Online via Zoom Cloud Meeting (MAP C) ⁽¹⁾

Lab: Onsite at D401-01 (fourth floor), Institute of Molecular Biosciences ⁽²⁾

Teaching Schedule

MBNS 600 Neurobiology

Lecture: 23 Aug 2023 – 25 Sep 2023 | Lab: 18 Sep 2023 – 20 Sep 2023 |

Course duration: 23 Aug 2023-25 Sep 2023

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Date	Time	Topic	Lecturer
23 Aug 2023	09.30-10.00	Course Orientation	Jiraporn ⁽¹⁾
23 Aug 2023	10.00-12.00	L1: Cell biology of neurons, neuroglia, and supporting elements	Nuanchan ⁽¹⁾
23 Aug 2023	13.00-15.00	L2: Anatomical terms & External structures of the brain	Sujira ⁽¹⁾
25 Aug 2023	10.00-12.00	L3-1: Electrical activities of neuron and glial cells L3-2: Blood circulation of the brain, CSF pathway and blood-brain barrier	Sukonthar ⁽¹⁾
25 Aug 2023	13.00-15.00	L4: Spinal cord	Sukonthar ⁽¹⁾
28 Aug 2023	10.00-12.00	L5: Brainstem and diencephalon	Sujira ⁽¹⁾
28 Aug 2023	13.00-15.00	L6: Reticular formation	Jiraporn ⁽¹⁾
29 Aug 2023	10.00-12.00	L13-1: Cerebrum and cerebral cortex L13-2: Brain and language	Jiraporn ⁽¹⁾
30 Aug 2023	10.00-12.00	L7: Motor pathways	Narisorn ⁽¹⁾
30 Aug 2023	13.00-15.00	L8: Basal ganglia and cerebellum	Narisorn ⁽¹⁾
1 Sep 2023	10.00-12.00	L9: Somatosensory system	Banthit ⁽¹⁾
1 Sep 2023	13.00-15.00	L10: Visual system	Banthit ⁽¹⁾
4 Sep 2023	10.00-12.00	L11: Auditory and vestibular systems	Sujira ⁽¹⁾
4 Sep 2023	13.00-15.00	L12: Hypothalamus and autonomic nervous system	Sukonthar ⁽¹⁾
6 Sep 2023	09.00-16.00	Written Exam I (L1-L8)	Somsong ⁽¹⁾
8 Sep 2023	10.00-12.00	L15: Cognition and executive brain functions	Nuanchan
8 Sep 2023	14.00-16.00	L14: Limbic system, basal forebrain, learning and memory	Anuck
18 Sep 2023	9.00-11.00	Lab #1: Microscopic structure and ultrastructure of neurons, glia, and peripheral nerve	Nuanchan

	11.00-12.00 13.00-16.00	Lab #2: Brain vascular supply, and CSF pathway Lab #3: Microscopic study of the spinal cord	Sukonthar
19 Sep 2023	9.00-12.00	Lab #4: Brain structures in motor pathway, limbic system and cerebellum	Narisorn/Jiraporn
	13.00-16.00	Lab #5: Sensory organs and pathways	Banthit/Jiraporn
20 Sep 2023	9.00-11.00	Lab #6: Hypothalamus	Sukonthar
	12.00-16.00	Lab #7: Brainstem and diencephalon Lab #8: Functional localization of cerebral cortex	Sujira/Jiraporn
22 Sep 2023	09.00-12.00	Student Presentation	Faculty Staff
25 Sep 2023	09.00-16.00	Laboratory Exam (Lab1-8) and Written Exam II (L9-L15)	Somsong

Student presentation sessions:

To encourage sharing knowledge and boost presentation skills, students will be assigned with the topic to be presented in class. Each presentation should take 15-20 minutes. Evaluation of presentation performance will be assessed according to rubric scoring method.

Presentation date and time	Topics
Presentation Date: 29 Aug 2023 Time: 9.00-12.00	Theme: comparative brains (2 students/group if possible) Rodents Cats Dogs Fish Octopus Whales Nematodes Insects Monkeys

Assessment Criteria:

Assessment Criteria	Assessment Method	Scoring Rubric
Assignments/ Examination (60%)	(1) Multiple choices questions (2) Short essay questions (3) Take-home assignments	(1) Comprehension (2) Scoring directly from true/false answer
Laboratory performance (25%)	(1) Direct observation (2) Practical examination (3) In-class discussion	(1) Comprehension (2) Scoring directly from true/false answer

Assessment Criteria	Assessment Method	Scoring Rubric
Presentation of assigned topics (10%)	(1) Short presentation	(1) Information quality and organization of topic presented (2) Verbal communication and English proficiency (3) Visual tools
Class attendant (5%)	(1) Number of classes signed in (2) Direct observation	(1) Student participation in class

Grading and evaluation

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
85-100	A	Excellent
80-84	B+	Very good
70-79	B	Good
60-69	C+	Fairly good
50-59	C	Fair
45-49	D+	Poor
40-44	D	Very poor
< 40	F	Failing

ATTENTION

- (1) Since this course is a core requirement course, if students receive final grade below "B", they will need to re-enroll this course in the next academic year.
- (2) According to the Faculty of Graduate Studies regulation, enrolled students are required to attend classed more than 80% of total class time. Students will be disqualified from examination if they fail to comply with this regulation.

Scoring rubric for evaluation of student presentation (10% for each presentation)

Presentation performance evaluation rubric (10% of total score)					
Criteria	Outstanding (score = 5)	Above average (score = 4)	Average (score = 3)	Below average (score = 2)	Poor (score = 1)

<p>Information quality and organization of topic presented (including answering the questions) (5%)</p>	<p>The information presented is accurate, comprehensive, and well-organized, with a clear and logical structure</p>	<p>The information presented is mostly accurate and well-organized, with a clear structure</p>	<p>The information presented is generally accurate and adequately organized, with a clear structure</p>	<p>The information presented is partially accurate and poorly organized, with a confusing structure</p>	<p>The information presented is inaccurate and poorly organized, with a very confusing structure</p>
<p>Delivery (2.5%)</p>	<p>Uses clear and confident language, maintains strong eye contact, uses appropriate and effective nonverbal communication, and adapts to the audience in a seamless way</p>	<p>Uses clear and confident language, maintains strong eye contact, uses appropriate nonverbal communication, and adapts to the audience</p>	<p>Uses clear language, maintains some eye contact, and uses appropriate nonverbal communication, but may not adapt to the audience as well</p>	<p>Uses unclear language, lacks eye contact, and does not use appropriate nonverbal communication</p>	<p>Does not use clear language, lacks eye contact, and does not use appropriate nonverbal communication</p>
<p>Visual tools (2.5%)</p>	<p>The visual tools used (e.g., slides, charts, diagrams) are visually appealing, relevant, and effectively support the presentation</p>	<p>The visual tools used are visually appealing and relevant, but could be better integrated into the presentation</p>	<p>The visual tools used are adequate and relevant, but could be improved</p>	<p>The visual tools used are poorly designed and not well integrated into the presentation</p>	<p>The visual tools used are not relevant or effective</p>

Date revised: 27 June, 2023