

Course Syllabus
MBNS 600 Neurobiology
Academic Year 2022

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. Asst. 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 Putthaphongpuek
2. Somsong Phengsukdaeng
3. Sasithorn Prommet

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: First/ 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) I
2. Explain the fundamental concepts on the cellular and anatomical organization of the human nervous system. (PLO2) P

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. Demonstrate 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. Explain the fundamental concepts on the cellular and anatomical organization of the human nervous system.	<ol style="list-style-type: none"> (4) Lecture (5) Laboratory practice by observation of brain specimens, microscopic slides, and diagrams. (6) In-class discussion 	<ol style="list-style-type: none"> (3) Written examination (4) Laboratory examination (5) 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. Demonstrate 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: Online via Zoom Cloud Meeting ⁽¹⁾

Lab: Onsite at D401-02 (fourth floor), Institute of Molecular Biosciences ⁽²⁾

Schedule

MBNS 600 Neurobiology

Lecture: 23 Jan 2023 – 13 Feb 2023 | Lab: 15 Feb 2023 – 17 Feb 2023 |

Start date: 23 Jan 2023

Course end: 24 Feb 2023

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Date	Time	Topic	Lecturer
23 Jan 2023	09.00-09.30	Course Orientation	Jiraporn ⁽¹⁾
23 Jan 2023	09.30-11.30	L1: Cell biology of neurons, neuroglia, and supporting elements	Nuanchan ⁽¹⁾
23 Jan 2023	13.00-15.00	L2: Anatomical terms & External structures of the brain	Sujira ⁽¹⁾
25 Jan 2023	09.00-11.00	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 Jan 2023	13.00-15.00	L4: Spinal cord	Sukonthar ⁽¹⁾
27 Jan 2023	09.00-11.00	L5: Brainstem and diencephalon	Sujira ⁽¹⁾
27 Jan 2023	13.00-15.00	L6: Reticular formation	Jiraporn ⁽¹⁾
30 Jan 2023	09.00-11.00	L7: Motor pathways	Narisorn ⁽¹⁾
30 Jan 2023	13.00-15.00	L8: Basal ganglia and cerebellum	Narisorn ⁽¹⁾
1 Feb 2023	09.00-11.00	L9: Somatosensory system	Banthit ⁽¹⁾
1 Feb 2023	13.00-15.00	L10: Visual system	Banthit ⁽¹⁾
3 Feb 2023	09.00-11.00	L11: Auditory and vestibular systems	Sujira ⁽¹⁾
3 Feb 2023	13.00-15.00	L12: Hypothalamus and autonomic nervous system	Sukonthar ⁽¹⁾
6 Feb 2023	09.00-16.00	Written Exam I (L1-L8)	Somsong
8 Feb 2023	09.00-11.00	L13: Limbic system, basal forebrain, learning and memory	Anuck ⁽¹⁾
8 Feb 2023	13.00-15.00	L14-1: Cerebrum and cerebral cortex L14-2: Brain and language	Jiraporn ⁽¹⁾
10 Feb 2023	09.00-11.00	L15: Cognition and executive brain functions	Nuanchan ⁽¹⁾

15 Feb 2023	9.00-11.00	Lab #1: Microscopic study of neurons, neuroglia, supporting elements, and peripheral nerve	Nuanchan ⁽²⁾
	11.00-12.00 13.00-16.00	Lab #2: Gross anatomy of the brain, vascular supply, and CSF pathway Lab #3: Gross anatomy and microscopic study of the spinal cord	Sukonthar ⁽²⁾ Sujira ⁽²⁾
16 Feb 2023	9.00-11.00	Lab #4: Brainstem and diencephalon	Sujira/Jiraporn ⁽²⁾
	11.00-12.00 13.00-14.00	Lab #5: Brain structures in motor pathway and cerebellum	Narisorn/Jiraporn ⁽²⁾
	14.00-16.00	Lab #6: Sensory organs and pathways	Banthit/Jiraporn ⁽²⁾
17 Feb 2023	10.00-12.00	Lab #7: Hypothalamus and limbic system	Sukonthar/Sujira ⁽²⁾
	13.00-15.00	Lab #8: Functional localization of cerebral cortex	Sujira/Jiraporn ⁽²⁾
20 Feb 2023	9.00-11.00	Student Presentation	RCN staff
22 Feb 2023	13.00-16.00	Laboratory Exam (Lab1-8)	RCN staff
24 Feb 2023	09.00-12.00	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: 20 Feb 2023 Time: 9.00-11.00	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 (40%)	(1) Multiple choices questions	(1) Comprehension

Assessment Criteria	Assessment Method	Scoring Rubric
	(2) Short essay questions Take-home assignments	(2) Scoring directly from true/false answer
Laboratory performance (20%)	(1) Direct observation (2) Practical examination (3) In-class discussion	(1) Comprehension (2) Scoring directly from true/false answer
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 (10%)	(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	Fall

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	Excellent (score = 5)	Very good (score = 4)	Adequate (score = 3)	Limited (score = 2)	Poor (score = 1)
Information quality and organization of topic presented (including answering the questions) (5%)	Main points are explicitly presented with impressive detail and organization. Information is directly linked to the topic of presentation.	Main points are presented with good amount of detail. Information is well-organized and linked to the topic given.	Main points are somewhat clear but could add some more detail. Information is organized and linked to the topic given.	Main points are not clear and lack detail. Information is loosely organized and some are off-topic.	Main points are missed and have no detail. Information is disorganized and off-topic.
Verbal communication and English proficiency (2.5%)	Speaker's voice is very steady, clear and confident. Spoken language is very fluent and grammatically corrected.	Speaker's voice is steady and confident. Spoken language is fluent and mostly grammatically corrected.	Speaker's voice is moderately confident but could be developed. Spoken language is mediocre and has some grammatical errors.	Speaker's voice is unsteady and lacks confident. Use of spoken language needs to be improved, and many errors can be recognized.	Speaker fails to deliver proper presentation orally. Unable to deliver presentation via spoken English language.
Visual tools (2.5%)	Visual aids are very creative, easy to read and greatly enhance presentation.	Visual aids are typically clear and easy to follow.	Visual aids are good in terms of quality, but some points can be improved.	Limited visual aids are used or difficult to help audiences follow the topic.	No visual aids are used, and presentation is not interested by audiences.

Date revised: 8th Dec, 2022