

**Course Syllabus**  
**MBNS 600 Neurobiology**  
**Academic Year 2019**

**Course ID and Name:** MBNS 600 Neurobiology

**Course coordinator:** Asst. Prof. Kittikun Viwatpinyo, Ph.D.

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**Instructors:**

1. Prof. Banthit Chetsawang, Ph.D.
2. Assoc. Prof. Naiphinich Kotchabhakdi, Ph.D.
3. Assoc. Prof. Nuanchan Chutabhakdikul, Ph.D.
4. Assoc. Prof. Wipawan Thangnipon, Ph.D.
5. Asst. Prof. Kittikun Viwatpinyo, Ph.D.
6. Asst. Prof. Sujira Mukda, Ph.D.
7. Asst. Prof. Sukonthar Ngampramuan, Ph.D.
8. Asst. Prof. Vorasith Siripornpanich, MD, Ph.D.
9. Chutikorn Nopparat, Ph.D.

**Supporting Staff:**

1. Kanda Putthaphongpheuk
2. Somsong Phengsukdaeng
3. Sasithorn Prommet

**Credits:** 3 (2-2-5)

**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:** None

**Course learning outcomes (CLOs)**

Upon completion of this course, students are able to:

1. Explain the fundamental concepts on the cellular and anatomical organization of the human nervous system. (PLO1)

2. 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. (PLO1)
3. Demonstrate information technology and interpersonal communication skills through discussion of interesting topics in the field of neurobiology. (PLO6)

**Alignment of teaching and assessment methods to course learning outcome:**

<b>Course learning outcome</b>	<b>Teaching method</b>	<b>Assessment method</b>
1. Explain the fundamental concepts on the cellular and anatomical organization of the human nervous system.	(1) Lecture (2) Laboratory practice by observation of brain specimens, microscopic slides and diagrams. (3) In-class discussion	(1) Written examination (2) Laboratory examination (timed-station)
2. 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.	(1) Lecture (2) Laboratory practice by observation of brain specimens, microscopic slides and diagrams. (3) In-class discussion	(1) Written examination (2) Laboratory examination (timed-station)
3. Demonstrate information technology and interpersonal	(1) Individual assignment	(1) Presentation of assigned topic

communication skills through discussion of interesting topics in the field of neurobiology.		
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**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 man, development of the nervous system and anatomical and functional studies of each brain region.

**Course schedule:**

Date: Monday to Friday

Time: 09.00 – 15.00

Rooms: A112 and D401, Institute of Molecular Biosciences

Date & time	Topic	Instructor
<b>Aug 13, 2019</b>		
09.00-11.00	Lecture 1: Cell biology of neurons, neuroglia, and supporting elements	Nuanchan
13.00-15.00	Lab: Ultrastructure of neurons, neuroglia, and supporting elements	Nuanchan
<b>Aug 14, 2019</b>		
09.00-11.00	Lab: Intro to gross anatomy of the brain and spinal cord	Kittikun
<b>Aug 15, 2019</b>		
09.00-10.00	Lecture 2.1: Blood circulation of the brain, CSF pathway and blood-brain barrier	Sukonthar
10.00-11.00	Lecture 2.2: Electrical activities of neuron and glial cells	Sukonthar
13.00-14.00	Lab: Vascular supply of the brain and CSF pathway	Sukonthar

14.00-15.00	Lab: Peripheral nerve	Sukonthar
<b>Aug 16, 2019</b>		
09.00-11.00	Lecture 3: Spinal cord	Sukonthar
13.00-15.00	Lab: Gross anatomy and microscopic examination of spinal cord	Sukonthar
<b>Aug 19, 2019</b>		
09.00-11.00	Lecture 4: Brainstem and diencephalon	Kittikun
13.00-15.00	Lab: External structure of brainstem and cranial nerves	Kittikun
<b>Aug 20, 2019</b>		
13.00-15.00	Lab: Internal structure of brainstem and diencephalon	Kittikun
<b>Aug 21, 2019</b>		
10.00-11.30	Special lecture1: Spinal cord & Brainstem syndromes	Vorasith
13.00-16.00	Meet the expert: Brainstem reticular formation	Naiphinich
<b>Aug 22, 2019</b>		
09.00-11.00	Lecture 5: Somatosensory system	Kittikun
13.00-15.00	Lab: Somatosensory system	Kittikun
<b>Aug 23, 2019</b>		
09.00-11.00	Lecture 6: Visual system	Banthit
13.00-15.00	Lab: Visual system	Banthit
<b>Aug 26, 2019</b>		
09.00-11.00	Lecture 7: Auditory system	Sujira
13.00-15.00	Lab: Auditory system	Sujira
<b>Aug 27, 2019</b>		
9.00-11.00	Lecture 8: Olfactory and gustatory systems	Chutikorn

13.00-15.00	Lab: Olfactory and gustatory systems	Chutikorn
<b>Aug 28, 2019</b>		
09.00-11.00	Lecture 9: Basal ganglia and cerebellum	Kittikun
13.00-15.00	Lab: Basal ganglia and cerebellum	Kittikun
<b>Aug 30, 2019</b>		
09.00-11.00	Special lecture 2: Disorders of motor system	Vorasith
13.00-15.00	Tutorial session I	Kittikun
<b>Sep 2, 2019</b>	<b>Examination I (Lecture 1-8)</b>	
<b>Sep 3, 2019</b>		
09.00-11.00	Lecture 10: Vestibular system	Naiphinich
13.00-15.00	Lecture 11: Motor system	Naiphinich
<b>Sep 6, 2019</b>		
09.00-11.00	Lecture 12: Hypothalamus and autonomic nervous system	Sukonthar
13.00-15.00	Lab: Hypothalamus and autonomic nervous system	Sukonthar
<b>Sep 9, 2019</b>		
09.00-11.00	Lecture 13: Limbic system, basal forebrain and cognition	Wipawan
13.00-15.00	Lecture 14: Cerebrum, cortical brain networks and language	Vorasith
<b>Sep 10, 2019</b>		
09.00-11.00	Lab: Limbic system	Chutikorn
13.00-15.00	Lab: Cerebrum and functional localization of cerebral cortex	Vorasith
<b>Sep 11, 2019</b>		
09.00-11.00	Lecture 15: Executive brain functions	Nuanchan
13.00-15.00	Special lecture 3: Clinical signs and symptoms of cortical lesion	Vorasith
<b>Sep 16, 2019</b>		
09.00-12.00	Student presentation: Nervous system of the animal model organisms	Kittikun

13.00-15.00	Tutorial session II	Kittikun
Sep 20, 2019	Examination II (Lecture 9-15)	

**Assessment criteria:**

Assessment criteria	Assessment method	Scoring rubrics
Written examination (60%)	(1) Multiple choices questions (2) Short essay questions	Scoring directly from true/false answer
Laboratory examination (20%)	(1) Timed-station questions	Scoring directly from true/false answers
Presentation of assigned topic (10%)	(1) Short presentation	(1) Information quality and organization of topic presented (2) Verbal communication and English proficiency (3) Non-verbal communication (4) Visual tools
Class attendance and participation in in-class discussion (10%)	(1) Numbers of classes signed in (2) Direct observation	Scoring directly from times of signing in

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
85 -100	A
80 – 84	B+
70 - 79	B
60 - 69	C+
50 - 59	C

45 - 49	D+
40 - 44	D
< 40	F

Notice: 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.

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)
<b>Information quality and organization of topic presented (including answering the questions) (2.5%)</b>	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.
<b>Verbal communication and English proficiency (2.5%)</b>	Speaker’s voice is very steady, clear and confident. Spoken language is very fluent and	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	Speaker’s voice is unsteady and lacks confident. Use of spoken language needs to be improved,	Speaker fails to deliver proper presentation orally. Unable to deliver presentation via spoken English language.

	grammatically corrected.		some grammatical errors.	and many errors can be recognized.	
<b>Non-verbal communication (2.5%)</b>	Speaker appears to be comfortable and confident. Effective uses of eye contacts and gestures are presented to support the presentation.	Speaker appears to be fairly confident. Eye contacts and gestures are generally used.	Speaker appears to be generally at ease. Moderate use of eye contact and gesture but not very effective.	Speaker appears uneasy, insecure or panicked. Eye contact and gesture are rarely used.	Speaker is obviously uncomfortable for presentation. No eye contact or gesture is presented.
<b>Visual tools (2.5%)</b>	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 : June 19, 2019