

**Course Syllabus**  
**MBNS 755 Advanced Neuroscience**  
**Academic Year 2024**

**Course ID and Name:** MBNS 755 Advanced Neuroscience

**Course Coordinator:** Asst. Prof. Sukonthar Ngampramuan, Ph.D.

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**Instructors:**

1. Prof. Banthit Chetsawang, Ph.D. (banthit.che@mahidol.edu)
2. Assoc. Prof. Nuanchan Chutabhakdikul, Ph.D. (nuanchan.chu@mahidol.edu)
3. Assoc. Prof. Doctor. Vorasith Siripornpanich, M.D., Ph.D. (vorasith.sir@mahidol.edu)
4. Assoc. Prof. Sujira Mukda, Ph.D. (Sujira.muk@mahidol.edu)
5. Assoc. Prof. Paul Klosen, PhD, HDR
6. Asst. Prof. Sukonthar Ngampramuan, Ph.D. (sukonthar.nga@mahidol.edu)
7. Asst. Prof. Jiraporn Panmanee, Ph.D. (jiraporn.pan@mahidol.edu)
8. Lect. Dr. Siraprapa Boobphahom, Ph.D. s.boobphahom@gmail.com
9. Lect. Dr. Ekkaphot Khongkla, Ph.D. (ekkaphot.kho@mahidol.edu)

**Supporting Staff:**

1. Mrs. Somsong Phengsukdaeng
2. Mrs. Sasithorn Prommet

**Credits:** 2 (2-0-4)

**Curriculum:** Doctor of Philosophy Program in Neuroscience  
Ph.D. plan 2.1, 2.2 (required course)

**Semester offering:** Second semester

**Pre-requisites:** None

**Course learning outcomes (CLOs):**

Upon completion of this course, students are able to:

1. Possess broad, profound advanced knowledge and cutting-field for neuroscience research (R) (PLO 1, PLO 2)
2. Capable of tracking advancements and shifting trends in neuroscience knowledge (R) (PLO 2, PLO 3)
3. Present and discuss the novel research ideas (R) (PLO1,PLO4,PLO5)

Alignment of teaching and assessment methods to course learning outcome:

Course learning outcome	Teaching method	Assessment method
<b>CLO1:</b> Possess broad, profound advanced knowledge and cutting-edge tools for neuroscience research (PLO 1, PLO 2)	(1) Lecture (2) Class discussion (3) student active learning	(1) assignment (2) In-class discussion
<b>CLO2:</b> Capable of tracking advancements and shifting trends in neuroscience knowledge (PLO 2, PLO 3)	(1) Lecture (2) Class discussion (3) student active learning	(1) assignment (2) In-class discussion
<b>CLO3:</b> . Present and discuss the novel research ideas (PLO1,PLO4,PLO5)	Presentation and discussions	(1) Student presentation (2) In-class discussion (3) Oral presentation score sheet

**Course Description:**

Advanced knowledge and cutting-edge tools for neuroscience research; tracking advancements and shifting trends knowledge in neuroscience; present and discuss the novel research ideas.

Course schedule: MBNS 755 Advanced Neuroscience

Academic Year 2024

Date: Monday, Wednesday, Friday

Time: 09.30 – 11.30, 13.00-15.00

Venue: Room A and online zoom meeting

No	Date/	Time	Topic/Details	Lecturer
1	10 Sep 2024	09.30-11.30	<b>L1:</b> Introduction to Advance Neuroscience The Next 10 years of Neuroscience	Sukonthar
2		13.00-15.00	<b>L2:</b> Concepts and Principles of Research the “practical” approach	Paul online
3	11 Sep 2024	09.00-11.00	<b>L3:</b> Applications of structural biology in neuroscience research	Jiraporn online
4		13.00-15.00	<b>L4:</b> Circadian rhythms: from cellular clocks to neuroendocrine control of physiologythms	Paul online
5	13 Sep 2024	09.30-11.30	<b>L5:</b> Placental Mechanisms of Neurodevelopmental Disorders	Nuanchan
6		13.00-15.00	<b>L6:</b> Optical sensing and biosensing for neurotransmitters	Siraprapa
7	16 Sep 2024	09.30-11.30	<b>L7:</b> What happens in the brain when a stroke occurs?	Sujira
8		13.00-15.00	<b>L8:</b> Electrochemical sensors for neurodegenerative disorders	Siraprapa
9	18 Sep 2024	09.00-11.00	<b>L9:</b> Proteomics in neuroscience	Jiraporn online
10		13.00-15.00	<b>L10:</b> Neuroscience of active learning and direct instruction	Nuanchan
11	20 Sep 2024	09.30-11.30	<b>L11:</b> From systems to behaviors	Sukonthar
12		13.00-15.00	<b>L12:</b> Role of PANoptosis in neuronal cell death	Sujira

No	Date/	Time	Topic/Details	Lecturer
13	23 Sep 2024	09.30-11.30	<b>L13:</b> Home sleep test, Actigraphy, and other novel sleep studies	Vorasith
14		13.00-15.00	<b>L14:</b> Exosome research in neuroscience & the road ahead	Ekkaphot
15	25 Sep 2024	09.30-11.30	<b>L15:</b> Neuroimmunology	Banthit
16	30 Sep 2024	13.00-15.00	Student presentation	Staff online

### Assessment Criteria:

Assignment 50%

Presentation 30%

Class discussion 10%

Class attendance 10%

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

Date revised: July 2024