Course Syllabus

MBNS 755 Advanced Neuroscience

Academic Year 2026

Course ID and Name: MBNS 755 Advanced Neuroscience

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

1. Assoc. Prof. Nuanchan Chutabhakdikul, Ph.D. (nuanchan.chu@mahidol.ac.th)
2. Assoc. Prof.Doctor. Vorasith Siripornpanich, M.D., Ph.D. (vorasith.sir@mahidol.ac.th)
3. Assoc. Prof. Sujira Mukda, Ph.D. (sujira.muk@mahidol.ac.th)
4. Asst. Prof. Sukonthar Ngampramuan, Ph.D. (sukonthar.nga@mahidol.ac.th)
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6. Lect.Dr. Siraprapa Boobphahom, Ph.D. (siraprapa.boo@mahidol.ac.th)
7. Lect. Dr. Ekkaphot Khongkla, Ph.D. (ekkaphot.kho@mahidol.edu)
8.

Supporting Staff:

Mr. Prapan Premsawat

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
CLO1: 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
CLO2: 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
CLO3: . 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 2026

Date: Monday, Wednesday, Friday (14 sep - 9 Oct) Mon, Wed, Fri 09.30 - 15.30

Venue: Room A207 and online zoom meeting

Theme: Based Advanced Neuroscience; Separate to 4 Modules

No	Date	Time	Module	Instructors
1	**Week1** 14 Sep 16 Sep 18 Sep	Morning 9.30-11.30 Afternoon 13.30-15.30	**Module I: Frontiers in Cognitive Neuroscience** **Topics outline** Future directions in Neuroscience Developmental Neuroscience & Neurodevelopmental Disorders	Vorasith Nuanchan Sumeth
2	**Week2** 21 Sep 23 Sep 25 Sep	Morning 9.30-11.30 Afternoon 13.30-15.30	**Module 2: Neural Circuits, Behavior and Brain Function** **Topics outline** Neural circuits Plasticity Circadian rhythms Learning and memory Behavioral neuroscience	Banthit Sujira Sukonthar
3	**Week3** 28 Sep 30 Sep 2 Oct	Morning 9.30-11.30 Afternoon 13.30-15.30	**Module 3: Advanced Technologies in Neuroscience** **Topics outline** AI and Neuroscience Big Data /Computational Neuroscience Emerging Technologies	Sumeth Jiraporn Ekkaphot
4	**Week4** 5 Oct 7 Oct 9 Oct	Morning 9.30-11.30 Afternoon 13.30-15.30	**Module 4: Translational Neuroscience: Diagnostics, Therapeutics and Future direction Presentation** **Topics outline** Innovation technology Translational diagnostics and Therapeutic Research gap identification and Enterpernior mind set for Presentation-Output platform* *Presentation will be held on Oct 9th in the afternoon session	Sukonthar Siraprapa Ekkaphot Sumeth *All staff for presentation

Daily Schedule

Morning Session (9.30-11.30)

Core lecture

Landmark papers

Case studies

Afternoon Session (13:30–15:30)

Group discussion

Research proposal workshop

Each Module assessment

Student presentation

Assessment Criteria:

Assessment Methods

Module Reflection Portfolio (30%)

Students will submit a brief reflection (1–2 pages) at the end of each module (Modules 1–4).

The reflection should address:

Major advances and emerging concepts discussed in the module

Current limitations and knowledge gaps

Potential applications to the student's own research project

Weight:

Module 1: 7.5%

Module 2: 7.5%

Module 3: 7.5%

Module 4: 7.5%

Journal Club Presentation (20%)

Each student will select one recent high-impact neuroscience research article (published within the last 3 years) related to one of the course modules.

Presentation Components:

Background and rationale

Research objectives

Experimental design and methodology

Key findings

Strengths and limitations

Future research directions

Assessment Criteria:

Understanding of the topic (30%)

Critical analysis (30%)

Ability to lead discussion (20%)

Presentation skills (20%)

Weight: 20%

Total: 30%

Class Participation and Scientific Discussion (10%)

Students are expected to actively participate in all class discussions, journal clubs, and faculty-led seminars.

Assessment Criteria:

Attendance

Engagement in discussion

Quality of questions and comments

Constructive peer feedback

Weight: 10%

Oral Presentation (20%)

Students will present their proposal to a faculty panel and participate in a scientific discussion.

Assessment Criteria:

Scientific rationale

Novelty and innovation

Feasibility

Methodological rigor

Presentation and communication skills

Ability to respond to questions

Weight:

Oral Presentation: 20%

Assessment Summary

Research Perspective Report (30%)..... 30%

Journal Club Presentation 20%

Class Participation and Discussion 10%

Written Research Proposal 20%

Research Proposal Presentation 20%

Total 100%

Assessment Component	Weight (%)	Details
Assignment & Class Discussion	50%	- Students are assigned individual or group-based research papers to read and discuss in class. - Each student is responsible for presenting or discussing key insights, raising critical questions, and leading discussion during assigned sessions. - Quality of engagement and depth of critical thinking will be evaluated.
Presentation	30%	- Students are required to deliver a formal presentation on a neuroscience topic. - Assessment is based on content accuracy, depth of analysis, clarity, and delivery skills.
Class Attendance & Participation	20%	- Active and punctual attendance in all class sessions. - Constructive contribution to in-class discussions.

Teaching and Assessment Methods

Teaching Methods:

Lectures and interactive seminars

Student-led paper discussions

Problem-based and case-based learning sessions

Guided presentations on selected neuroscience topics

Assessment Methods:

Assignment-based critical review and discussion (50%)

Oral presentation with Q&A (30%)

Class attendance and participation (20%)

Rubric for Assignment & Class Discussion (50%)

	Excellent (4)	**Good (3)**	**Satisfactory (2)**	**Needs Improvement (1)**
Understanding of Assigned Paper	Demonstrates thorough understanding of key concepts, methodology, and implications	Demonstrates clear understanding with minor gaps	General understanding, but lacks depth or misses key points	Minimal understanding; major concepts misunderstood or omitted
Critical Thinking & Insight	Provides original, in-depth insights; asks thought-provoking questions and offers deep analysis	Provides relevant insights; poses appropriate questions with adequate analysis	Some insights offered, but lacks depth or clarity	Superficial analysis; lacks critical thinking
Discussion Leadership & Engagement	Actively leads discussion; encourages participation and keeps the discussion focused and dynamic	Leads discussion effectively; some engagement with peers	Limited effort in discussion leadership; passive or minimal peer interaction	Does not lead or engage in discussion

	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
Communication & Clarity	Presents clearly and confidently; uses appropriate academic language and logical organization	Presentation is mostly clear; minor issues with language or structure	Somewhat unclear or disorganized; occasionally difficult to follow	Poorly structured; unclear expression; difficult to understand

Scoring

Each criterion is scored on a 1–4 point scale. Total possible score: 16 points

Weighted score (converted to 50%): Final Score = (Total Points / 16) × 50

Rubric for Presentation (30%)

Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
Content Accuracy & Depth	Covers topic thoroughly with accurate and current information; demonstrates deep understanding	Generally accurate and appropriate content with minor omissions	Basic understanding with some inaccuracies or superficial coverage	Inaccurate, incomplete, or unclear content
Organization & Flow	Presentation is well-structured, logically organized, and easy to follow	Mostly clear and organized with minor lapses in flow	Some disorganization; difficult to follow in parts	Poorly structured; lacks logical flow

Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
Delivery & Communication	Speaks clearly and confidently; engages audience; effective use of visual aids (if any)	Generally clear and audible; some engagement and adequate visuals	Sometimes hard to hear or follow; limited engagement or visuals	Mumbles or reads slides; lacks confidence; ineffective communication
Response to Questions	Responds to questions with confidence, insight, and supporting evidence	Answers most questions well with minor gaps	Answers are brief or partially correct	Unable to answer questions or responds inaccurately

Scoring (Converted to 30%)

Each criterion is rated from 1 to 4 (maximum 16 points). Final Score = (Total Points / 16) × 30.

Rubric for Class Attendance & Participation (20%)

Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
Attendance	Attends all classes on time	Misses 1 class or occasionally late	Misses 2–3 classes or frequently late	Misses more than 3 classes or consistently late
Participation Quality	Actively contributes thoughtful comments and questions in every session	Regularly contributes with relevant comments	Occasionally participates; comments lack depth	Rarely participates; off-topic or distracted

Criteria	Excellent (4)	Good (3)	Satisfactory (2)	Needs Improvement (1)
Preparedness	Always well-prepared; demonstrates prior reading or research	Usually prepared with some evidence of preparation	Minimal preparation evident	Unprepared; no evidence of reading or engagement
Respect & Collaboration	Always respectful; encourages peers; supports collaborative environment	Generally respectful and constructive	Occasionally disrespectful or disengaged	Disruptive or dismissive toward others

Scoring (Converted to 20%)

Each criterion is rated from 1 to 4 (maximum 16 points). Final Score = (Total Points / 16) × 20.

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: June 2026