Course syllabus

MBNS608 Laboratory Rotation Training in Neuroscience

The academic year 2023

Course ID and Name: MBNS608 Laboratory Rotation Training in NeuroscienceMBNS

Course Coordinator: Prof. Banthit Chetsawang, Ph.D. Email: banthit.che@mahidol.ac.th

Instructors:

1. Prof. Banthit Chetsawang, Ph.D. (banthit.che@mahidol.ac.th)
2. Assoc. Prof. Nuanchan Chutabhakdikul, Ph.D. (nuanchan.chu@mahidol.ac.th)
3. Assoc. Prof. Vorasith Siripornpanich, M.D., Ph.D. (vorasith.sir@mahidol.ac.th)
4. Assoc. Prof. Sujira Mukda, Ph.D. (sujira.muk@mahidol.ac.th)
5. Asst. Prof. Sukonthar Ngampramuan, Ph.D. (sukonthar.nga@mahidol.ac.th)
6. Lect. Jiraporn Panmanee, Ph.D. (jiraporn.pam@mahidol.ac.th)
7. Lect. Siraprapa Boobphahom, Ph.D. (s.boobphahom@gmail.com)

Credits: 2(0-4-2)

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

Semester offering: First semester

Course learning outcomes:

Upon completion of the course, students are able to:

1. Apply the critical knowledge and technologies in neuroscience to develop the research project in neuroscience. (PLO3) R
2. Acquire experience and skills to conduct research in neuroscience with ethics awareness. (PLO1,2,4) P
3. Acquire scientific communication skills via presenting research projects and experimental data to the public via a short seminar. (PLO5)

Alignment of teaching and assessment methods to course learning outcome:

Course learning outcome	Teaching method	Assessment methods
1. Apply the critical knowledge and technologies in neuroscience to develop the research project in neuroscience.	- Mentoring by PI	- Student evaluation by the faculty mentor
2. Acquire experience and skills to conduct research in neuroscience with ethics awareness.	- Lecture - Mentoring by PI - Hands-on laboratory experience	- Student evaluation by the faculty mentor - Research report
3. Acquire scientific communication skills via presenting research projects and experimental data to the public via a short seminar.	- Research presentation and discussions	- Oral presentation score sheet

Course description:

Rotation training in different neuroscience's laboratories; experimental design; performing experiments with research ethics awareness; analyzing and interpreting the experimental data; presentations of the results via a short seminar; research report

Course schedule:

Date: August 7 to December 1, 2023

Time: 09.00-12.00 or Manage by the course coordinator and Faculty mentor

Room RCN Laboratory

Class activity will be held by an onsite-laboratory or online platform depending on the situation of the COVID-19 pandemic in Thailand.

Date/Time	Topic/Details	Number of Hours	Class Activity/ Teaching Media	Lecturer
Oct 5, 2023 09.00-12.00	Course orientation	3	- Orientation - Short presentation on research interests or research projects by faculty staff	Banthit and faculty staff
Oct 24-26, 2023 09.00-12.00	Student rotation in lab 1 (Each student selects only 1 lab)	9	- active learning, group discussion, - Hands-on laboratory	Banthit, Sujira, Jiraporn
Oct 27 and Oct 30-31 2023 09.00-12.00	Student rotation in lab 2 (Each student selects only 1 lab)	9	- active learning, group discussion, - Hands-on laboratory	Nuanchan, Vorasith, Sukonthar
Nov 1-10, 2023 09.00-12.00	- Discussion on a selected topic of research interests and research project	24	- active learning, group discussion, research project preparation	Faculty mentor
Nov 13-24, 2023 09.00-12.00	- Performing experiments with research ethics awareness	30	- Hands-on research experiment	Faculty mentor
Nov 27-30, 2023 09.00-12.00	- Analysis and interpretation of the experimental data	12	- Discussion on a research project with a faculty mentor - Preparation of research project and experimental data for oral presentation	Faculty mentor
Dec 1, 2023 9.00-16.00	- Research project and experimental data presentation	6	Oral presentation	Faculty staff

Assessment Criteria:

Assessment criteria	Assessment method	Scoring rubrics
Student performance evaluation by a faculty mentor 50%	(1) Direct observation	Scoring directly from the performance of the student
Research project 20%	(1) Research project	Scoring directly from the quality of the report
Presentation 30%	(1) Short presentation	(1) Information quality and organization of the topic presented (2) Verbal communication and English proficiency (3) Non-verbal communication (4) Visual tools

Student achievements will be graded using symbols: A, B+, B, C+ and C based on the distribution of student scores from the whole course.

Grading system

Final total score (100%)	85 to 100	A	GPA 4.0
	80 to 84	B+	GPA 3.5
	70 to 79	B	GPA 3.0
	60 to 69	C+	GPA 2.5
	50 to 59	C	GPA 2.0
	45 to 49	D+	GPA 1.5
	40 to 44	D	GPA 1.0

Date revised: April 18, 2023

Guideline and evaluation criteria for the presentation session

Criteria	Excellent (score = 5)	Very good (score = 4)	Adequate (score = 3)	Limited (score = 2)	Poor (score = 1)
Information quality and organization of the topic presented (including answering the questions)	The main points are explicitly presented with impressive detail and organization. Information is directly linked to the topic of the presentation.	The main points are presented with a good amount of detail. Information is well-organized and linked to the topic given.	The main points are somewhat clear but could add some more detail. Information is organized and linked to the topic given.	The main points are not clear and lack detail. Information is loosely organized and some are off-topic.	The main points are missed and have no detail. Information is disorganized and off-topic.
Verbal communication and English language proficiency	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 confidence. The use of spoken language needs to be improved, and many errors can be recognized.	Speaker fails to deliver a proper presentation orally. Unable to deliver presentation via spoken English language.
Non-verbal communication	Speaker appears to be comfortable and confident. Effective uses of eye contact and gestures are presented	Speaker appears to be fairly confident. Eye contacts and gestures are generally used.	Speaker appears to be generally at ease. The moderate use of eye contact and gesture but not very	The speaker appears uneasy, insecure, or panicked. Eye contact and gesture are rarely used.	Speaker is uncomfortable with the presentation. No eye contact or gesture is presented.

	to support the presentation.		effective.		
Visual tools	Visual aids are very creative, easy to read, and greatly enhance the 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 the presentation is not interested to audiences.

Rubric for evaluation of research project (total score = 70)

Criteria	Excellent (Score = 10)	Adequate (Score = 7)	Average (Score = 4)	Incompetent (Score = 0)
Introduction, background, and rationale of the research	Interesting introduction with strong and firm background supporting research proposal.	A well-formulated introduction with plausible background and rationale of the study is presented.	The introduction is mentioned with a loosely constructed background and weak rationale.	Absence of understandable introduction, background, or rationale.
Research question and objective	The compelling research question is presented with a clearly-stated objective of study.	The reasonable research question is presented and well-related to the research objective.	The research question is not interesting and the objective of the study is not strongly related to the question.	The research question and objective of the study are not mentioned and/or not related to neuroscience.
Research hypothesis	The conceivable hypothesis is formulated with a strong relationship with a research question.	The hypothesis is stated and can be related to the research question.	The hypothesis is not mentioned and not based on the research question.	The hypothesis is not mentioned.
Literature review	Related studies are in-depth reviewed and supportive of	Most of the past related studies are reviewed, with	A review of recent studies is not fully relevant and does	Investigation of previous related studies is not

	the proposal, with multiple theories and research approaches are described.	relevant theories are presented to support the proposal.	not present sufficient theories to support the proposal.	presented or is disorganized manner.
Methodology	Novel and well-designed methods are proposed with a robust relationship with research objectives. Human/animal ethical considerations have been approved.	Traditional methods that are related to research objectives are presented in detail. Human/animal ethical considerations have been approved.	Proposed methods are not fully related to research objectives, and not clearly described. Human/animal ethical considerations have not been approved	Proposed methods are not linked with research objectives, and do not lead to any results. Ethical issues are not resolved.
References	Proper references and in-text citations are given with appropriate citation format.	References and in-text citations are mostly given. The citation format is correct in general with some minor mistakes.	Some references or in-text citations are missed.	References and in-text citations are lacking.
Writing proficiency	Remarkably well-written proposal with no or very few grammatical errors.	The proposal book shows a good writing system with some grammatical errors.	The proposal book has many grammatical errors and needs major language revision.	The proposal does not write in English or does not write an incomprehensible manner.

Explanation of criteria assessment of student rotation in the lab

The scoring level is according to a student's performance in each criterion.

1 = poor; 2 = unsatisfactory; 3 = sufficient, 4 = good; 5 = very good, NA = not applicable.

Accuracy/precision

The student was very accurate/precise in setting up the experiment, testing the participants and collecting the research data

Planning (realization time schedule)

The experiment/study is performed within the prescribed period, corrected for documented delays

Organizational skills

The student demonstrated adequate organizational skills during the set-up and execution of the experiment/study

Data analysis

The student showed an understanding of the statistical analyses and performed them adequately and independently

Level of independence

The student worked very independently during each phase of the internship

Taking initiative

The student took and showed initiative during the internship

Communication

The student communicated effectively with the supervisor and participants

Processing of feedback

The student addressed the given feedback adequately

Commitment

The student was willing to give time and energy to the internship and showed involvement

Dedication

The student showed up on time and kept promises/appointments that were made

Collaboration

The student was able and willing to work together with others

Collegiality

The student showed responsibility in sharing the workload