Course Syllabus

MBNS 659 Microtechniques in Neuroscience Research

Academic Year 2023

Course ID and Name: MBNS 695 Microtechniques in neuroscience research

Course coordinator: Assoc. Prof. Dr. Sujira Mukda

Tel: 02-441-9003-7 ext. 1206/ 1437

Email: sujira.muk@mahidol.edu

Instructors:

1. Assoc. Prof. Dr. Sujira Mukda
2. Asst. Prof. Dr. Narisorn Kitiyanant
3. Asst. Prof. Dr. Kittikun Viwatpinyo
4. Asst. Prof. Dr. Jiraporn Panmanee
5. Dr. Ekkaphot Khongkla

Supporting Staff:

1. Ms. Kanda Putthaphongpheuk
2. Ms. Kornkanok Promthep
3. Ms. Somsong Phengsukdaeng
4. Ms. Sasithorn Prommet

Credits: 1 (0-2-1)

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

Semester offering: Second semester

Pre-requisites: None

Course learning outcomes (CLOs)

Upon completion of this course, students can:

1. Demonstrate learning and working integrity (including honesty, discipline, punctuality, and obedience) (Aligned with PLO1(P))
2. Explain the process in production of quality microscopic slides from brain specimens for research in histopathology and in molecular biology. (Aligned with PLO2(P))
3. Apply theoretical knowledge in establishing valid protocols and solving problems during production of microscopic slides. (Aligned with PLO3(P))
4. Demonstrate proper interpersonal skills and responsibility. (Aligned with PLO4 (P))
5. Produce and present qualified microscopic slides that can be analyzed for obtaining histological information. (Aligned with PLO5 (P))

Alignment of teaching and assessment methods to course learning outcome:

Course learning outcome	Teaching method	Assessment method
(1) Demonstrate learning and working integrity (including honesty, discipline, punctuality, and obedience)	(1) Pre-session overview	(1) Class Attendance (complete and punctual?) (2) Examination (cheating?) (3) Assignments (plagiarism?)
(2) Explain the process in production of quality microscopic slides from brain specimens for research in histopathology and in molecular biology.	(1) Lecture (2) Laboratory hands-on practical session (3) In-class discussion	(1) Written examination (2) Student presentation and evaluation of submitted microscopic slides
(3) Apply theoretical knowledge in establishing valid protocols and solving problems during production of microscopic slides.	(1) Laboratory hands-on practical session	(1) Student presentation and evaluation of submitted microscopic slides
(4) Demonstrate proper interpersonal skills and responsibility	(1) Assignments/ Exercises	(1) Performance in social skills (2) Assignments (submitted on time?)
(5) Produce qualified microscopic slides that can be analyzed for obtaining histological information.	(1) Laboratory hands-on practical session	(1) Student presentation and evaluation of submitted microscopic slides

Course description:

Practical sessions of the paraffin method, cryosectioning and immunohistochemical techniques; the analyses and discussions of results

การฝึกปฏิบัติการเตรียมชิ้นเนื้อโดยเทคนิคพาราฟิน การตัดชิ้นเนื้อแช่แข็งและเทคนิคทางอิมมูโนฮิสโตเคมี การวิเคราะห์และอภิปรายผลงาน

Course schedule:

Date: Monday-Friday

Time: 09.30-16.30

Venue: Lecture: Room A401[(1)] Institute of Molecular Biosciences

Lab: Rooms D401-04[(2)] Institute of Molecular Biosciences

Course schedule

MBNS 659 Microtechniques in Neuroscience Research

08 December 2023 – 22 December 2023

Course Coordinator: Assoc. Prof. Sujira Mukda

Tel: 02-441-9003-7 ext. 1206, 1437

E-mail: sujira.muk@mahidol.edu

	Date	Time	Topic	Lecturer
0	8 Dec 2023	09.00-09.30	**L0:** Course orientation	Sujira[(1)]
		09.30-10.00	**Pre-course L1:** Introduction to microtechnique in neuroscience research	Sujira[(1)]
		10.00-12.00	**Pre-course L2:** Theories and applications of microscopes	Narisorn[(1)]
1		13.00-16.00	***Lab1*:** Tissue processing for cryosection & Cryosectioning	Sujira/Jiraporn[(2)]
2	13 Dec 2023	09.30-12.30	***Lab2*:** Immunohistochemistry: Staining	Sujira[(2)]
3		13.30-16.30	***Lab3*:** Immunohistochemistry: Photomicrography & Image analysis	Sujira[(2)]
4	14 Dec 2023	09.30-12.30	***Lab4*:** Tissue processing by paraffin technique practice: Sample preparation	Kittikun/Sujira[(2)]
5		13.30-16.30	***Lab5*:** Tissue processing by paraffin technique practice: H&E staining	Kittikun[(2)]
6	15 Dec 2023	09.30-12.30	***Lab6*:** Tissue processing by paraffin technique practice: Nissl staining	Kittikun[(2)]
7		13.30-16.30	***Lab7*:** Tissue processing by paraffin technique practice: Summary	Kittikun[(2)]
8	18 Dec 2023	09.30-12.30	***Lab8*:** Sample preparation for Immunocytochemistry	Ekkaphot/Sujira[(2)]
9		13.30-16.30	***Lab9*:** Immunocytochemistry: Staining	Ekkaphot/Sujira[(2)]
10	19 Dec 2023	09.30-12.30	***Lab10*:** Immunocytochemistry: Photomicrography & Image analysis	Ekkaphot/Jiraporn[(2)]
	22 Dec 2023	13.30-16.30	Student Presentation	Sujira & RCN Staff

Assessment criteria:

Assessment criteria	Assessment method	Scoring rubrics
Quiz (30%)	(1) Quiz after the class	(1) Scoring directly from true/false answer
Laboratory performance (20%)	(2) Direct observation (3) Practical examination (4) In-class discussion	(2) Ability to follow procedure or to design a procedure for experiment (3) Use of equipment (4) Working area and safety (5) Group work
Slide submission (20%)	(1) Evaluation of slide quality (2) Student presentation of submitted results	(1) Evaluation of laboratory result rubric focusing on quality of submitted works, laboratory protocol recording, student presentation of result analysis and problem-solving strategy.
Presentation of assigned topic (20%)	(1) Short presentation	(1) Information quality and organization of topic presented (2) Verbal and non-verbal communication and English proficiency (3) Critical thinking (4) Visual tools
Class attendance and participation in in-class discussion (10%)	(1) Numbers of classes signed in (2) Direct observation	(1) 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

ATTENTION

(1) *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 <u>disqualified</u> from examination if they failed to comply with this regulation.*

Date revised: 30 November 2023