Course Description

Name of Institution Mahidol University

Campus/Faculty/Department Institute of Molecular Biosciences

Section 1 General Information

1. Course Code and Course Title ชมชม ๖๓๖ สัตว์ทดลองทางวิทยาศาสตร์ สำหรับงานวิจัยทางชีววิทยาศาสตร์

MBMB 636 Experimental Animal for Biosciences Research

2. Number of Credit 1 (0–2–1) Credit

(Lecture-Laboratory-Self Study)

3. Curriculum and Type of Subject

Master of Science Program in Molecular and Integrative Biosciences (International Program): Elective course

Doctor of Philosophy Program in Molecular and Integrative Biosciences (International Program): Elective course

4. Faculty Member in Charge of this Course and Lecturers

4.1 Faculty Member in Charge of this Course

Associate Professor M.L.Saovaros Svasti, Ph.D.

Thalassemia Research Center, Institute of Molecular Biosciences, Mahidol University

Tel: 02-889-2558

Email: saovaros.sva@mahidol.ac.th

4.2 Lecturers who Teach in this Course

1. Associate Professor M.L.Saovaros Svasti, Ph.D.
   Thalassemia Research Center, Institute of Molecular Biosciences, Mahidol University
   Tel: 02-889-2558
   Email: saovaros.sva@mahidol.ac.th

5. Semester / Academic Year 1st semester, Academic year 20xx

6. **Pre-requisite** -None-
7. **Co-requisite** -None-
8. **Venue of Study** Institute of Molecular Biosciences, Mahidol University
9. **Date of Latest Revision** January 28, 2024

Section 2 Goals and Objectives

1. Goals of this Course

At the end of learning, students could

1. CLO1: Show proper usage of knowledge in Molecular and Integrative Biosciences to apply scientific experimental design that appropriate for using laboratory animal (PLO1)
2. CLO2: Perform handling laboratory animal such as behavior tests, gavage and sample collection (PLO2)
3. CLO3: Evaluate research projects base on ethical principle for animal research (PLO3)
4. CLO4: Synthesize novel research concept using laboratory animal that related to Molecular and Integrative Biosciences (PLO4)

2. Objectives of Development or Revision

Update the information and techniques about experimental animal for biosciences research that related to molecular and integrative biosciences.

Section 3 Course Management

1. Course Description

สัตว์ทดลองเพื่อการวิจัยด้านชีววิทยาศาสตร์ มุ่งเน้นการศึกษาจริยธรรมการวิจัยสำหรับสัตว์ทดลอง แบบจำลองหนูเมาส์ดัดแปรพันธุกรรม การเลี้ยงการสืบสายพันธุ์การจัดการสัตว์ทดลอง การวิเคราะห์ทางสถิติสำหรับขนาดตัวอย่างในการใช้สัตว์ทดลอง ทักษะทางเทคนิคในการจัดการหนูเมาส์เพื่องานวิจัย ได้แก่ การทดสอบพฤติกรรม การให้สารทางปาก และการเก็บตัวอย่าง

Experimental animal for biosciences research focus on study ethical principle for laboratory animal; transgenic mouse model; laboratory animal husbandry; statistical analysis for sample size in animal models; technical skills to handle mouse model such as behavior tests, gavage and sample collection

2. Credit Hours per Semester

Lecture	7.5	Hour
Laboratory/Field Trip/Internship	-	Hour
Laboratory	15	Hour
Self Study	30	Hour

3. Number of hours that lecturers provide counseling and guidance to individual student

Students can consult directly in class or during 12.00 a.m. - 1.00 p.m. on Tuesday and Thursday in August to November, and can consult via email.

Section 4 Development of Students' Learning Outcome

1. Knowledge

1.1 Expected Outcomes on Knowledge Development

1.1.1 Synthesize knowledge in Molecular and Integrative Biosciences to create the novel research that use laboratory animal (PLO 1● Major responsibility)

1.2 Teaching Methods

1.2.1 Lecture, laboratory and discuss in scientific techniques, critical thinking and scientific development for new knowledge or innovation, laboratory practice in laboratory animal such as behavior tests, gavage and sample collection

1.2.2 Individual or Group assignment

1.3 Evaluation Methods

1.3.1 Quality of concept note in research for use laboratory animal

1.3.2 Quality of assignment

1.3.3 Behavior in class activity and quality of performance

2. Skills

2.1 Expected Outcomes on Skills

2.1.1 Demonstrate techniques in behavior teats, gavage and sample collection. (PLO2 ● Major responsibility)

2.2.2 Demonstrate the statistical analysis for determining sample size of laboratory animal required for a research project (PLO2 O Minor responsibility)

2.2 Teaching Methods

2.2.1 Lecture, laboratory practice and discuss in statistical analysis for sample size estimation and technical skills to handle mouse model such as behavior tests, gavage and sample collection

2.2.2 Individual or Group assignment

2.3 Evaluation Methods

2.3.1 Quality of performance in class activity

2.3.2 Quality of assignment or report

3. Ethics

3.1 Expected Outcomes on Morality and Ethics

3.1.1 Evaluate unknown project as a reviewer board member of Instituteional Animal Care and Use Committee (PLO3 ● Major responsibility)

3.1.2 Create concept note in animal research that adheres to ethial priciple for animal research

3.2 Teaching Methods

3.2.1 Lecture, case study and discuss in for ethical research in animals

3.2.2 Individual or Group assignment

3.3 Evaluation Methods

3.3.1 Quality of evaluation on unknown projects as case study

3.3.2 Quality of assignment or report

4. Characters

4.1 Expected Outcomes on Characters

4.1.1 Show scientific thinking with ethical concern in research projects and animal handling (PLO4 ● Major responsibility)

4.1.2 Communicate to others and be attention during practise (PLO4 ● Major responsibility)

4.2 Teaching Methods

4.2.1 Lecture, laboratory practice and discuss in experimental animal research

4.2.2 Individual or Group assignment

4.3 Evaluation Methods

4.3.1 Behavioral observation

Section 5 Teaching and Evaluation Plans

1. **Teaching Plan**

Week or No.	Topic	Hours			Teaching Methods / Media	Lecturers
		Lecture	Laboratory	Self Study		
1	Overview on experimental animal research	0.5	0	1	Lecture, Laboratory practise, Discussion, Assignment, Report	Staffs
2	Ethical principle for laboratory animal	1	0	2		Staffs
3	Transgenic mouse model	1	0	2		Staffs
4	Laboratory animal husbandry	1	0	2		Staffs
5	Statistical analysis for sample size in animal models	1	2	4		Staffs
6	Behavior tests	1	7	9		Staffs
7	Gavage and food/medicine preparation	1	3	5		Staffs
8	Sample collection	1	3	5		Staffs
	Total	7.5	15	30		

2. Evaluation Plan

Activity	Learning Outcomes*	Evaluation Method	Week or No. of Evaluation	Proportion of Evaluation
1	PLO1 Knoledge	— Class attendance — Concept note in research and Discussion in scientific techniques, critical thinking and scientific development for new knowledge or innovation — Assignment or report	1-8	30
2	PLO2 Skills	— Class attendance — Behavioral observation and self-preparation before joint the class — Practical skill/proformance — Assignment or report	5-8	40
3	PLO3 Ethics	— Class attendance — Behavioral observation and self-preparation before joint the class — Assignment or report	2, 5-8	20
4	PLO4 Characters	— Class attendance — Behavioral observation and self-preparation before joint the class — Quality of question and performance in class — Assignment or report	1-8	10

* Refer to PLO

Section 6 Teaching Materials and Resources

1. Textbooks and Main Documents

1. National Research Council. 2011. Guide for the Care and Use of Laboratory Animals: Eighth Edition. The National Academies Press. Washington, DC.
2. Melissa A. Larson ed. 2020. Transgenic Mouse Methods and Protocols. Methods in Molecular Biology. Humana. New York, NY.

2. Documents and Important Information

-None-

3. Documents and Recommended Information

-None-

Section 7 Evaluation and Improvement of Course Management

1. Strategies for Evaluation of Course Effectiveness by Students

Allow students to evaluate lecturer's performance and topic in class or online-evaluation.

2. Strategies for Evaluation of Teaching Methods

Evaluate of teaching method by 360 degree from colleague, staff and students.

3. Improvement of Teaching Methods

All the teaching methods will be discussed in the monthly academic meeting.

4. Verification of Students' Learning Outcome

Evaluate students by using rubric, report, assigment, and examination.

5. Review and Plan to Improve Course Effectiveness

In the monthly academic meeting, all the teaching techniques and teaching materials will be reviewed and then develop a plan for the improvement for the next academic year.

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