



THE MODULE HANDBOOK
DOCTOR BIOLOGICAL SCIENCES STUDY PROGRAM
FACULTY OF BIOLOGY

SELECTED TOPIC FOR DISSERTATIONS

Microscopy and Animal Models

Course code	BIDB243065
Course level	Doctoral Program
Semester/ term	Odd/even
Course coordinator	Prof. Dr. Bambang Retnoaji, S.Si., M.Sc.
Lecture(s)	Prof. Dr. Bambang Retnoaji, S.Si., M.Sc. Dr. Ardaning Nuriliani, M.Kes. Dr. med.vet. Hendry Saragih, M.P. Zuliyati Rohmah, S.Si., M.Si., Ph.D.Eng. Susilohadi, S.Si., M.Si., Ph.D Nur Indah Septriani, S.Si., M.Sc., Ph.D.
Language	Indonesian/English
Classification within the Curriculum	Compulsory Specialization Courses
Teaching format/ class hours per week during the semester	This course is planned to have 14 teaching weeks and 2 weeks of examination.
Workload	1,125 hours/day 5 days/week 5,625 hours/week 16 Weeks/Semester total workload : 90 hours/3,6 ECTS
Credits	3.6 ECTS
Requirements	-
Program Learning Outcome	CPL 1.2. Upon completing this program, the graduates demonstrate an attitude of being able to demonstrate honesty, responsibility, self-confidence, emotional maturity, ethics, and awareness of being a lifelong learner CPL 2.1. After attending this program, graduates demonstrate an understanding of the scientific philosophy of biology which is related in depth to structure, function, diversity, reproduction, evolution and engineering of biological systems CPL 3.3. After completing this program, the graduates will be able to manage and formulate valid and accountable research data by upholding academic integrity and prioritizing anti-plagiarism



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	CPL 4.1. After participating in this program, graduates will be able to propose new solutions or recommend proposed solutions to solve biological resource problems in a sustainable manner through an interdisciplinary or multidisciplinary approach to fund deduction or induction
Course Learning Outcome	BIDB243065.1 By the end of this course, students will be able to understand the basic concepts and the role of model organisms in biological and biomedical research. BIDB243065.2 By the end of this course, students will be able to identify commonly used model organisms and explain the rationale for their use in research. BIDB243065.3 By the end of this course, students will be able to demonstrate proficiency in the safe, ethical, and protocol-compliant handling, euthanasia, and treatment of model organisms. BIDB243065.4 By the end of this course, students will be able to understand and apply macroscopic and microscopic parameters in analyzing the structure and function of tissues in model organisms. BIDB243065.5 By the end of this course, students will be able to demonstrate proficiency in cellular and molecular techniques and analyses to understand biological processes in model organisms. BIDB243065.6 By the end of this course, students will be able to apply ethical principles and Good Laboratory Practice (GLP) in the use and management of model organisms
Course Description	This course is designed to provide advanced knowledge and skills related to the use of model organisms in biological and related scientific research. It covers a range of microscopy techniques commonly applied in model organism studies. Students will learn about key model organisms such as mice, Rasbora fish, and zebrafish, including technical aspects such as handling, euthanasia, treatment, and appropriate sampling methods. The course also introduces microscopic analysis of tissues and structures in model organisms. Advanced microscopy techniques including light microscopy, fluorescence, confocal, and electron microscopy will be discussed in depth, enabling students to understand and apply these tools within scientific research contexts. In addition, the course emphasizes ethical considerations in the use of animals for research, highlighting the importance of sustainable and responsible research practices. By the end of the course, students are expected to be able to apply both theoretical and practical skills in research projects, with a deeper



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	understanding of the role of model organisms and microscopy in biological and biomedical studies.
Assessments	The assessment for Selected Topic for Dissertations (Microscopy and Model Organisms) is based on four components, with the respective criteria and weights: 1. Structured Assignment/Task (40%) 2. Presentation/Project (40%) 3. Mid-Term Exam (10%) 4. Final-Term Exam (10%)
Study Media and Literature	Main 1. Kardong, K. V. (2019). Vertebrates: Comparative anatomy, function, evolution (8th ed.). McGraw-Hill Education. 2. Hall, B. K. (2014). Evolutionary developmental biology (2nd ed.). Springer. 3. Romer, A. S., & Parsons, T. S. (1986). The vertebrate body (6th ed.). Saunders College Publishing.. Additional 1. Gilbert, S. F., & Barresi, M. J. (2016). Developmental biology (11th ed.). Sinauer Associates, Inc.. 2. Pough, F. H., Janis, C. M., & Heiser, J. B. (2013). Vertebrate life (9th ed.). Pearson.