



THE MODULE HANDBOOK
DOCTOR BIOLOGY STUDY PROGRAM
FACULTY OF BIOLOGY

SELECTED TOPIC FOR DISSERTATIONS

Comparative Anatomy and Evolution

Course code	BIDB203007
Course level	Doctoral Program
Semester/ term	Odd/even
Course coordinator	Dr. Bambang Retnoaji, S.Si., M.Sc.
Lecture(s)	Dr. Bambang Retnoaji, S.Si., M.Sc. Susilohadi, S.Si., M.Si., Ph.D. Zuliyati Rohmah, S.Si., M.Si., Ph.D. Eng.
Language	Indonesian/English
Classification within the Curriculum	Compulsory
Teaching format/ class hours per week during the semester	This course is planned to have 14 teaching weeks and 2 weeks of examination.
Workload	90 hours
Credits	2-0 credits / 3.6 ECTS
Requirements	Receiving approval from the Supervisory Team.
Program Learning Outcome	<p>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</p> <p>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</p> <p>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</p> <p>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</p>



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Course Learning Outcome	<p>BIDB243069.1 By the end of this course, students will be able to identify and analyze the anatomical structures of various animal groups through a comparative approach, with emphasis on evolutionary relationships and morphological adaptations.</p> <p>BIDB243069.2 By the end of this course, students will be able to integrate fundamental and advanced evolutionary concepts such as natural selection, homology, analogy, morphological convergence, and divergence within the context of comparative animal anatomy.</p> <p>BIDB243069.3 By the end of this course, students will be able to apply modern techniques, including geometric morphometrics, molecular phylogenetic analysis, and high-resolution imaging, to study and understand morphological changes in animals within an evolutionary context</p> <p>BIDB243069.4 By the end of this course, students will be able to formulate relevant and innovative research questions related to animal anatomy and evolution, and design appropriate experiments to address those questions.</p> <p>BIDB243069.5 By the end of this course, students will be able to critically analyze and interpret research data with a high degree of accuracy, and present scientific findings in a manner that supports the development of a significant dissertation in the field of animal anatomy and evolution</p> <p>BIDB243069.6 By the end of this course, students will be able to develop novel hypotheses related to the evolution of biological structures in animals and test these hypotheses through critical and systematic research approaches</p>
Course Description	<p>This course provides an academic platform for in-depth and critical examination of anatomical structures across various animal groups, with emphasis on evolutionary relationships and morphological adaptations. Designed for doctoral students engaged in dissertation research, the course integrates fundamental and advanced evolutionary principles such as natural selection, homology, analogy, and mechanisms of morphological convergence and divergence. Through a comparative approach, students will explore morphological variation and transformation from an evolutionary perspective, spanning individual organs to complex biological systems. The course also incorporates the application of modern techniques in anatomical and evolutionary studies, including</p>



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	<p>geometric morphometrics and high-resolution imaging. Students will be guided in formulating relevant research questions, designing experiments, and analyzing and interpreting data, with the aim of supporting the development of a dissertation that makes a significant scientific contribution to the field of animal anatomy and evolution. This course emphasizes the development of novel hypotheses on the evolution of biological structures and prepares students to become leaders in research within this discipline.</p>
Assessments	<p>The assessment for Selected Topic for Dissertations (Comparative Anatomy and Evolution) is based on four components, with the respective criteria and weights:</p> <ol style="list-style-type: none">1. Structured Assignment/Task (40%)2. Presentation/Project (40%)3. Mid-Term Exam (10%)4. Final-Term Exam (10%)
Study Media and Literature	<p>Main</p> <ol style="list-style-type: none">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.. <p>Additional</p> <ol style="list-style-type: none">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.