THE MODULE HANDBOOK
DOCTOR BIOLOGY STUDY PROGRAM
FACULTY OF BIOLOGY

SELECTED TOPIC FOR DISSERTATIONS

Organogenesis and Teratology

Course code	BIDB203009
Course level	Doctoral Program
Semester/ term	Odd/even
Course coordinator	Prof.Dr. Bambang Retnoaji, S.Si., M.Sc.
Lecture(s)	Dr.med.vet. drh. Hendry Saragih, M.P. Prof.Dr. Bambang Retnoaji, S.Si., M.Sc. Zuliyati Rohmah, S.Si., M.Si., Ph.D.Eng. Dr. Ardaning Nuriliani, S.Si., M.Kes.
Language	Indonesian/English
Classification within the Curriculum	Selected Topic For Dissertations
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	CPL 2.1.Upon completing this program, the graduates will be able to discover or develop new scientific theories/concepts/ideas in biology. CPL 2.2. After attending this program, graduates will be able to contribute to the development and practice of the field of biology through scientific research based on scientific principles and ethics through interdisciplinary, multidisciplinary, or transdisciplinary approaches in solving problems in the field of biology
Course Learning Outcome	BIDB203009.1 By the end of this course, Students will be able to understand the basic concepts, principles, and theories related to the formation of functional organs; comprehend reproduction and organogenesis in animals from a molecular perspective; and explain the stages of embryonic development in relation to the sensitivity to external or environmental factors that may cause abnormalities in organ structure or damage to normal cells and tissues.

	BIDB203009.2 By the end of this course, Students will be able to understand gene regulation in gametogenesis and organogenesis, as well as comprehend the potential of chemicals, infectious agents, and drugs as teratogenic agents and their mechanisms of interaction. BIDB203009.3 By the end of this course, Students will be able to analyze cases of developmental abnormalities and structural defects in animal organs caused by teratogens or other toxic factors.
Course Description	This course provides an understanding of organ formation processes during embryonic development in animals and humans, as well as structural and developmental abnormalities. Topics covered include reproduction, molecular perspectives on organ formation (organogenesis), and gene regulation during gametogenesis and organogenesis, leading to the development of functional organs, along with the mechanisms regulating organ formation. This course also examines developmental abnormalities, focusing on substances with potential teratogenic effects on embryos and their mechanisms of action. Special emphasis is placed on the causes of developmental disorders, teratogenic substances and drugs, and maternal conditions that may result in abnormal embryonic development.
Assessments	The assessment for Selected Topic for Dissertations (Organogenesis and Teratology) is based on three main components, with the respective criteria and weights: A. Partisipatory Activity (20% B. Project Result/Case Studi result/PBL Result (30%) C. Kognitif • Assignment (5%) • Quizz (5%) • Mid-term Exam (20%) • Final-term Exam (20%)
Study Media and Literature	**Main**: a. https://embryology.med.unsw.edu.au/embryology/index.php/Animal_Development b.https://embryo.asu.edu/pages/embryonic-differentiation-animals c.http://users.rcn.com/jkimball.ma.ultranet/BiologyPages/E/EmbryonicDevelopment.html d.http://www.britannica.com/science/animal-development e.http://www.britannica.com/science/animal-development/Organ-formation f.Lutz Slomianka, 2009, Blue Histology, University of Western Australia, http://www.lab.anhb.uwa.edu.au/mb140/ g.http://www.embryology.ch/genericpages/moduleorganoen.html **Addition**: 1.https://www.cdc.gov/ncbddd/birthdefects/surveillancemanual/chapters/chapter-1/chapter1-4.html 2.https://www.who.int/news-room/fact-sheets/detail/congenital-anomalies 3.https://www.cdc.gov/ncbddd/fasd/index.html

	4.https://embryology.med.unsw.edu.au/embryology/index.php/Abnormal_Development_-_Thalidomide 5. https://embryo.asu.edu/pages/retinoids-teratogens 6. https://stemcells.nih.gov/ 7. https://www.diabetes.org/diabetes