Animal Models in Biomedical Research

Module designation	Providing an understanding of laboratory animals in biomedical research, in terms of ethics, regulations, handling, and laboratory management. Providing an understanding of modeling and the types of laboratory animals suitable for biomedical engineering research.
Module level, if applicable	Master
Code	SPSTB212239
Subtitles, if applicable	-
Courses, if applicable	-
Semester(s) in which the module is taught	Odd/Even semester
Person responsible for the module	Prof. drh. Agustina Dwi WIjayanti
Lecturers	Prof. drh. Agustina Dwi Wijayanti drh. Imron Rosyadi, M.Sc., Ph.D Ida Fitriana, S.Farm., Apt., M.Sc., Ph.D
Language	Indonesian & English
Relation to curriculum	Elective course
Type of teaching, contact hours	This course is planned to have 14 teaching weeks and 2 weeks of examination. several types of teaching conducted: - Classic tutorial, - Case-study learning, - Discussion - Laboratory visit

Workload	This course is planned to have 13 teaching weeks, 1 week lab visit, and 2 weeks of examination. Lectures = 3 SKS x 50 minutes x 15 meetings = 2250 minutes = 37.5 hours = 37.5 hours/25 hours =1.5 ECTS Experiment/laboratory visit = 3 SKS x 60 minutes x 1 meeting = 180 minutes = 3 hours = 3/25 hours = 0.12 ECTS Assigment = 3 SKS x 60 minutes x 16 meetings = 2880 minutes = 48 hours = 48 hours/ 25 hours =1.92 ECTS Self Study = 3 SKS x 60 minutes x 16 meetings = 2880 minutes = 48 hours = 48 hours/ 25 hours =1.92 ECTS Total workload = 5.46 ECTS
Credit points	3 SKS (5.46 ECTS)
Requirements according to the examination regulations	-
Recommended prerequisites	-
Module objectives/intended learning outcomes	PLO 2: Able to design research related to artificial organs and medical instrumentation. PLO 3: Able to test and analyze relevant design results in biomedical engineering field. PLO 4: Able to communicate and work effectively in a multi-disciplinary team.

Content	1. Using animals in biomedical research: why education holds the key 2. Animal models in biomedical research - ethical concerns 3. Basic animal handling technique 4. Biohazards & environmental safety 5. Factors that can influence animal research 6. Anesthesia, analgesia and aseptic technique, animal monitoring, euthanasia methods & recordkeeping 7. Selection of animal model 8. Methodologies for the molecular, biochemical, cellular and genetic analyses in studies with model organisms 9. Animal models for cancer 10. Animal models for infectious diseases 11. Chicken and mouse as model organisms 12. Other model organisms: E. coli, C. elegans, D. melanogaster, zebra fish, non-human primates 13. In vivo, non-invasive, imaging systems and their applications in animal experimentation, computer modelling 14. Designing experimental approaches using experimentation animals to study pathologies or physiological processes in biomedicine. 15. Laboratory practice → Pharmacology laboratory: animal handling and application of drugs on experimental animals
Study and examination requirements and forms of examination	Classes are conducted with 80% classic tutorial and 20% case study/project based presentation. Exams are done by written exam and/or task-based exam.
Media employed	PowerPoint, LMS (eLok, Google Classroom, etc.), and online meeting platform (Zoom, Gmeet, etc.)
Reading list	1. Ibeh, B., 2018, Experimental Animal Models of Human Diseases: An Effective Therapeutic Strategy. London, UK : IntechOpen
Last modified	Desember 2025.