



FACULTY OF AGRICULTURE

DEPARTMENT OF ANIMAL SCIENCE

UNDERGRADUATE PROGRAM

MODULE HANDBOOK

Module designation	Feed Biotechnology
Semester(s) in which the module is taught	6 th semester
Person responsible for the module	Dr. Ir. Sitti Wajizah, M.Si
Language	Indonesia, English
Relation to curriculum	Elective module
Teaching methods	Tutorials, presentations, discussions, group assignments, individual assignments
Workload	<ul style="list-style-type: none"> • 100 minutes of lecture and discussion per week • 120 minutes of structured tasks per week • 120 minutes learn to be independent per week
Credit Points	2 SKS = 3.2 ects
Required and recommended prerequisites for joining the module	
Module objectives/intended learning outcomes	<ul style="list-style-type: none"> • Students can understand the concept of biotechnology approaches and the use of artificial intelligence in biotechnology to optimize the use of by-products as animal feedstuffs, improve digestibility and nutrient availability, enhance the health and efficiency of livestock production, and minimize waste production. • Students can explain the use of fermentation and enzymatic technology in the processing and utilization of feedstuffs to increase digestibility, improve nutrient availability, and minimize anti-nutrient content in feedstuffs, ensuring they are safe for livestock consumption. • Students can understand the use of organic waste to produce single-cell protein as a potential protein source for livestock to improve health, immune response, and livestock productivity. • Students understand the concept of genetic engineering to produce animal feed crops that are resistant to pests, herbicides, and drought, while increasing nutritional value, minimizing antinutrient content, and producing high yields.
Content	Feed Biotechnology is a course that studies the application of molecular engineering to biological reactions in animal feed to improve its quality and functionality. The topics include feed components (water, organic compounds, and inorganic compounds), types of feed based on their sources (fiber, energy, protein, minerals, and vitamins), and feed classification (basal feed, feed supplements, and feed additives). This course also covers the application of biotechnology to enhance feed productivity, nutritional value, digestibility, and detoxification, leading to the production of superior or functional feed that supports improved

	reproductive performance and livestock production (meat, milk, eggs, and hides) in a sustainable and environmentally friendly manner.
Exams and assessment formats	Group assignments, presentation, individual assignments, and an Exam
Study and examination requirements	Presence 10% Group assignment 20% Individual assignment 20% Presentation 20% Exam 30%
Reading list	<ol style="list-style-type: none"> 1. Oussama, S., & Chaima, B. (2023). Biotech meets Artificial Intelligence to Enhance the Value of By Products in Animal Nutrition. <i>Biological Sciences</i>, Vol. 03(01), Pp. 353-365 2. Abraham, S., Kechero, Y. (2024). Biotechnology in animal nutrition and feed utilization. <i>Biotechnology in animal nutrition and feed utilization. J. Livestock Sci.</i> 15: 120-124 3. Umami, N., Suhartanto, B., Suwignyo, B., Prasajo, Y. S., Nasution, M. D., & Runingtyas, L. 2024. <i>Bioteknologi dalam Pengembangan Hijauan Pakan Ternak di Indonesia</i>. Yogyakarta: Deepublish. 4. Siswoyo, P., Rusdhi, A., Lubis, H. P., Abdilla Yahya, I., & Sembiring, A. C. 2024. <i>Komposisi Pakan Ternak dengan Menggunakan Limbah Tani</i>. Jakarta: Tri Selaras Cendekia. 5. Rasad, S. D., & Solihat, N. 2023. <i>Bioteknologi Reproduksi Ternak</i>. Bandung: Unpad Press. 6. Pakpahan, B. M. T., Suprpto, S., Jubaidah, S. P. D., Batumahadi, I., Dharma, S., Damanik, M., & Eswanto, S. 2025. <i>Teknologi Pakan Ternak: Inovasi dan Implementasi untuk Produksi Ternak Berkelanjutan</i>. Padang: Get Press Indonesia.