

Module designation	Forage Engineering and Feed Technology
Semester(s) in which the module is taught	Odd Semester
Person responsible for the module	<p>Ir. Nafiatul Umami, S.Pt., M.P., Ph.D., IPM., ASEAN Eng.            Dr. Ir. Bambang Suhartanto, DEA., IPU            Ir. Bambang Suwignyo, S.Pt., M.P., Ph.D., IPM., ASEAN Eng.            Dr. Miftahush Shirothul Haq, S.Pt.            Prof. Dr. Ir. Ali Agus, DAA., DEA., IPU., ASEAN Eng.            Ir. Cuk Tri Noviandi, S.Pt., M.Anim.St., Ph.D., IPM., ASEAN Eng.            Ir. Andriyani Astuti, S.Pt., M.Sc., Ph.D. IPM.            Dimas Hand Vidya Paradhista, S.Pt., M.Sc., Ph.D.</p>
Language	Bahasa and English
Relation to curriculum	Specialization's compulsory
Teaching methods	Classical lecture and discussion
Workload (incl. contact hours, self-study hours)	<p>Total workload: 79 hours            Contact hours:                - Lecture: 23 hours                - Academic activity: 28 hours            Private study: 28 hours</p>
Credit points	2/0
Required and recommended prerequisites for joining the module	None
Module objectives/intended learning outcomes	<p>Course Outcomes (CO):</p> <ol style="list-style-type: none"> <li>1. Understand the basic principle of forage conservation and increase the quality of agricultural crops, as well as procedures in processing feed concentrate.</li> <li>2. Understand the chemical changes that occurred during the conservation and feed treatment, understand the effects of conservation and feed treatment towards feed fermentation in the rumen and livestock performance.</li> <li>3. Understand the mechanism changes in chemical composition, digestibility, and storage capacity of feed ingredients and finished feed, as a result of processing and storage.</li> <li>4. Able to formulate and solve problems in the cultivation of grass and legume plants, able to choose the right technique for the cultivation of feed crops (grass and legume) according to tropical climate.</li> <li>5. Master the techniques in the feed engineering both genetically and on farm (agronomy and physiology) towards the plant growth and production.</li> </ol> <p>Expected Learning Outcomes:</p> <ul style="list-style-type: none"> <li>- Attitudes and Behaviors:           <ol style="list-style-type: none"> <li>1. Be accountable in carrying the professional practice that includes ability to accept accountability towards decision and professional action. It shall be according to the scope of the practice under their responsibility and laws. (CO1, CO4, CO5)</li> </ol> </li> <li>- Mastery in Sciences:           <ol style="list-style-type: none"> <li>1. Able to master the current animal science and its application theory. (CO2)</li> </ol> </li> </ul>

	<ol style="list-style-type: none"> <li>2. Able to master the livestock production science, animal nutrition and feed science, animal products technology, and the livestock social economics in relation to food security and environment. (CO1)</li> <li>3. Able to master the design, management, and development of livestock research. (CO2, CO3, CO4, CO5)</li> </ol> <p>- Special skills:</p> <ol style="list-style-type: none"> <li>1. Able to design interdisciplinary and multidisciplinary research in the animal husbandry. (CO2, CO3)</li> <li>2. Able to formulate and solve problems in the national development especially in terms of animal husbandry. (CO5)</li> <li>3. Able to solve problems and anticipate issues in the development of animal science and industry. (CO4)</li> </ol> <p>- General skills:</p> <ol style="list-style-type: none"> <li>1. Able to develop logical, critical, systematic, and creative thought through scientific research, creation of design in the science and technology, which pays attention and applies humanity values according to their expertise. The graduates are able to arrange scientific concept and the study result based on the principles, procedures, and scientific ethics. (CO2, CO3)</li> <li>2. Able to identify the science that becomes their research object and position it to a research map by using information technology in the context of science development and expertise implementation developed through interdisciplinary or multidisciplinary approaches. (CO5)</li> <li>3. Able to communicate the result of reasoning and scientific research in form of thesis and scientific writing responsibly based on academic ethics in the accredited national journal. (CO5)</li> </ol>
Content	<p>Indonesia is a tropical land with two seasons in a year: rainy and dry season, causing strong fluctuation in the forage supply. In rainy season, there are plenty forage supply but very limited supply in the dry season, this too, depends on the length of the dry season. Supply of concentrated feed ingredients derived from grains and agricultural industry by-products are strongly influenced by the harvesting season. The supply of feed tends to be abundant during harvesting season and far less available on post-harvest and planting season. Crops by-products supply are very volatile following the main crops harvest. The course of Forage Engineering and Feed Technology is designed to equip student to be competent in feed crop engineering, both genetically and on farm (agronomy or physiology) towards plant growth, production and quality of tropical forage, forage conservation technology, increase the quality of agricultural crop residues (roughage), as well as concentrate processing and storing system.</p>

Exams and assessment formats	<b>Assessment Components</b>	<b>Course Outcomes (CO)</b>		<b>Percentage (%)</b>
	1. Midterm exam (written test, take home exam, paper assignment)	CO4 & CO5		40
	2. Final exam (written test, take home exam, paper assignment)	CO1, CO2 & CO3		40
	3. Short Quizzes	CO4		20
	<b>Grade and Score</b>			
	<b>Grade</b>	<b>Score</b>	<b>Grade</b>	<b>Score</b>
	A	≥80	C+	45-49,9
	A-	75-79,9	C	40-44,9
	A/B	70-74,9	C-	35-39,9
	B+	65-69,9	C/D	30-34,9
	B	60-64,9	D+	25-29,9
B-	55-59,9	D	20-24,9	
B/C	50-54,9	E	0-19,9	
Study and examination requirements	The final grade in the module is composed of 40% performance on Midterm exam, 40% final exam, 20% quiz. Students must have a final grade of 70% or higher to pass			
Reading list	Learning books and articles related to the topics.			