

Module designation	Nutritional Biochemistry and Physiology
Semester(s) in which the module is taught	Odd semester
Person responsible for the module	Prof. Dr. Ir. Lies Mira Yusiati, SU., IPU., ASEAN Eng. Prof. Dr. Ir. Zaenal Bachruddin, M.Sc., IPU., ASEAN Eng. Dr. Ir. Chusnul Hanim, M.Si., IPM., ASEAN Eng. Prof. Dr. Ir. Zuprizal, DEA., IPU., ASEAN Eng. Prof. Dr. Ir. Kustantinah, DEA. Ir. Cuk Tri Noviandi, S.Pt., M.Anim.St., Ph.D., IPM., ASEAN Eng. Andriyani Astuti, S.Pt., M.Sc., Ph.D. Ir. Bambang Suwignyo, S.Pt., M.P., Ph.D., IPM., ASEAN Eng. Dr. Ir. Bambang Suhartanto, DEA., IPU
Language	Bahasa and English
Relation to curriculum	Specialization's Elective
Teaching methods	Classical lecture and discussion
Workload (incl. contact hours, self-study hours)	Total workload: 79 hours Contact hours: - Lecture: 23 hours - Academic activity: 28 hours Private study: 28 hours
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. Students understand and are capable in explaining physiological and biochemical functions of livestock digestive organs as well as its influencing factors.</li> <li>2. Students understand and are capable in explaining biochemical and physiological activities of ruminal microbes.</li> <li>3. Student understand and are capable to explain metabolism process of biological compounds and its connection one to another, as well as it rules.</li> <li>4. Students understand and are capable to explain the link between intra and extra cellular of cell metabolites in various organs and their effects on anima production and reproductive performance.</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, CO2, CO3)</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. (CO1)</li> <li>2. Able to master the livestock production science, animal nutrition and fed science, animal products technology, and the livestock social economics in relation to food security and environment. (CO1)</li> </ol> </li> </ul>

	<ul style="list-style-type: none"> <li>- Special skills:               <ol style="list-style-type: none"> <li>1. Able to make innovation in the animal husbandry based on the development of science and technology. (CO2)</li> <li>2. Able to solve problems and anticipate issues in the development of animal science and industry. (CO2)</li> </ol> </li> <li>- General skills:               <ol style="list-style-type: none"> <li>1. Able to make a decision in the context of solving problems in the development of science and technology, which pays attention and applies humanity values based on analysis study or experiment towards information and data. (CO2)</li> <li>2. Able to communicate spoken and written English effectively by using the information technology for the development of animal science and its implementation. (CO3)</li> </ol> </li> </ul>																	
Content	<p>The life of animal is determined by the physiology of digestion activities, absorption, and metabolism of biological compounds in cells. Just like carbohydrates, proteins, lipids and nucleic acids, in which, the process is carried out enzymatically. To understand the biological process in every animal science study, we need to observe the logical life studies that are always related to physiological and biochemistry activities. Based on the above things, animal science students need to understand the formulation of feed and water intake, especially for ruminants and non-ruminant animals, physiology of digestion (poultry, ruminants and non-ruminants), dynamics of digestion and absorption of nutrients. Furthermore, there will be a discussion for metabolism of carbohydrates, proteins, lipids and nucleic acids on ruminants and non-ruminants, and their interaction during energy production process. The discussion will also talk about structures and kinetics of enzyme, abnormalities and metabolism setting, physiological system that includes hormonal, immune system and nerves, as well as the detoxification process.</p>																	
Exams and assessment formats	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Assessment Components</th> <th style="text-align: center;">Course Outcomes (CO)</th> <th style="text-align: center;">Percentage (%)</th> </tr> </thead> <tbody> <tr> <td data-bbox="595 1552 850 1731">1. Midterm exam (written test, take home exam, paper assignment)</td> <td data-bbox="866 1552 1129 1731" style="text-align: center;">CO1</td> <td data-bbox="1137 1552 1394 1731" style="text-align: center;">35</td> </tr> <tr> <td data-bbox="595 1731 850 1910">2. Final exam (written test, take home exam, paper assignment)</td> <td data-bbox="866 1731 1129 1910" style="text-align: center;">CO2, CO3 &amp; CO4</td> <td data-bbox="1137 1731 1394 1910" style="text-align: center;">35</td> </tr> <tr> <td data-bbox="595 1910 850 2000">3. Class participation</td> <td data-bbox="866 1910 1129 2000" style="text-align: center;">CO1, CO2, CO3 &amp; CO4</td> <td data-bbox="1137 1910 1394 2000" style="text-align: center;">10</td> </tr> <tr> <td data-bbox="595 2000 850 2063">4. Discussion</td> <td data-bbox="866 2000 1129 2063" style="text-align: center;">CO1, CO2, CO3 &amp; CO4</td> <td data-bbox="1137 2000 1394 2063" style="text-align: center;">20</td> </tr> </tbody> </table>	Assessment Components	Course Outcomes (CO)	Percentage (%)	1. Midterm exam (written test, take home exam, paper assignment)	CO1	35	2. Final exam (written test, take home exam, paper assignment)	CO2, CO3 & CO4	35	3. Class participation	CO1, CO2, CO3 & CO4	10	4. Discussion	CO1, CO2, CO3 & CO4	20		
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	<b>Grade and Score</b>			
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	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 35% performance on Midterm exam, 35% final exam, 10% class participation, and 20% take-home written assignment. Students must have a final grade of 70% or higher to pass			
Reading list	Learning books and articles related to the topics.			