



**UNIVERSITAS SUMATERA UTARA (USU)
FACULTY OF AGRICULTURE
ANIMAL SCIENCE STUDY PROGRAM**

**Document
Code
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SEMESTER LEARNING PLAN (SLP)

COURSE (Course)	CODE	COURSE GROUP	CREDIT		SEMESTER	Date of Compilation
Non Ruminant Nutrition Science	PTN3218	Exact	Theory =2	Practice =1	VI (Six)	
AUTHORIZATION / APPROVAL	SLP Developer Lecturer		Vice Dean I		Chairman of LINK-UP USU	
			Dr. Lisnawita, SP, MP		Prof. Dr. Dwi Suryanto M.Sc.	
Learning Outcomes	LO-PRODI Charged to MK					
	LO03	Able to identify, formulate, and find solutions to problems related to the livestock sector				
	LO06	Conduct supervision and evaluation of the completion of assigned work and be able to manage lifelong learning independently				
	LO09	Able to manage and implement aspects of efficient feed provision and technology				
	LO12	Have coherent and up-to-date knowledge in the field of animal science and in accordance with applicable legal regulations and can apply aspects of animal welfare.				
	Course Learning Outcomes (CLO)					CLO Credit
	CLO0326: Students will be able to explain the components, composition of nutrients and nutritional needs of non-ruminant livestock as well as the nutritional metabolism processes that occur in the bodies of non-ruminant livestock.					27.5%
	CLO0623: Able to explain the evaluation of feeding for non-ruminant livestock					27.5%
	CLO0913: Able to explain non-ruminant livestock feed processing technology to ensure sustainable feed availability.					12.5%

	CLO1127: Able to prepare non-ruminant livestock rations by utilizing waste found in the surrounding area	22.5%																																			
	Final Ability of Each Learning Stage (Sub-CLO)																																				
	Sub-CLO1	After taking this lecture, students will be able to explain the types, methods of administration and nutrient content of non-ruminant livestock feed (poultry, rabbits, horses and pigs).																																			
	Sub-CLO2	After taking this lecture, students will be able to explain the digestion and metabolism of nutrients (carbohydrates, fats and proteins) in non-ruminant livestock.																																			
	Sub-CLO3	After taking this lecture, students will be able to explain the assessment of the quality of animal feed ingredients.																																			
	Sub-CLO4	After taking this course, students will be able to explain feed processing technology (chemical, physical and biological)																																			
	Sub-CLO5	After taking this course, students will be able to evaluate the adequacy of nutrients for non-ruminant livestock.																																			
	Sub-CLO6	After taking this course, students will be able to prepare rations for non-ruminant livestock needs by utilizing agricultural waste.																																			
Correlation of CLO with Sub-CLO	<table border="1"> <thead> <tr> <th></th> <th>Sub-CLO 1</th> <th>Sub-CLO 2</th> <th>Sub-CLO 3</th> <th>Sub-CLO 4</th> <th>Sub-CLO 5</th> <th>Sub-CLO 6</th> </tr> </thead> <tbody> <tr> <td>CLO0326</td> <td>√</td> <td>√</td> <td>√</td> <td></td> <td></td> <td></td> </tr> <tr> <td>CLO0623</td> <td>√</td> <td>√</td> <td>√</td> <td></td> <td></td> <td></td> </tr> <tr> <td>CLO0913</td> <td></td> <td></td> <td></td> <td>√</td> <td></td> <td></td> </tr> <tr> <td>CLO1127</td> <td>√</td> <td></td> <td></td> <td></td> <td>√</td> <td>√</td> </tr> </tbody> </table>			Sub-CLO 1	Sub-CLO 2	Sub-CLO 3	Sub-CLO 4	Sub-CLO 5	Sub-CLO 6	CLO0326	√	√	√				CLO0623	√	√	√				CLO0913				√			CLO1127	√				√	√
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CLO0913				√																																	
CLO1127	√				√	√																															
Brief Description of Course	After completing the Non-Ruminant Nutrition Science course, sixth semester students of the Animal Husbandry Study Program, Faculty of Agriculture, University of North Sumatra are expected to be able to explain feed requirements, feed requirement evaluation, processing technology and preparation of non-ruminant livestock rations, so that after taking this course, students are expected to have skills in processing non-ruminant livestock feed.																																				
Study Material:	BK04 Animal Nutrition and Feed Science 1. Introduction																																				

Learning materials	<ol style="list-style-type: none"> 2. Types and content of non-ruminant livestock feed 3. Digestive system and feeding strategies 4. Nutrient metabolism (carbohydrates, proteins, fats) 5. Assessment of the quality of animal feed ingredients 6. Chemical feed processing technology 7. Physical feed processing technology 8. Biological feed processing technology 9. Preparation of rations and evaluation of nutritional adequacy of poultry livestock 10. Preparation of rations and evaluation of nutritional adequacy of rabbit livestock 11. Preparation of rations and evaluation of the adequacy of horse livestock nutrients 12. Preparation of rations and evaluation of nutritional adequacy of pig livestock 					
Library	<p>Main:</p> <ol style="list-style-type: none"> 1. Sjojfan, O., MH Natsir and IH Djunaidi. 2019. Science of Non-Ruminant Animal Nutrition. Brawijaya Press: Malang 2. Kadir, IA 2024. Ruminant and Non-Ruminant Animal Science. Indonesian Education and Training Development Center: West Nusa Tenggara 3. Wahditiya, AA, SL Pertiwi, N. Rahmi, et al. 2024. Animal Feed Processing Technology. CV. Gita Lentera: West Sumatra 4. Sudradjat and L. Riyanti. 2019. Animal Nutrition and Feed. Ministry of Agriculture Education and Training Center 					
	<p>Supporters:</p> <ol style="list-style-type: none"> 1. Racindran, V. 2012. Nutrition and Pathology of Non-ruminants. Animal Feed Science and Technology. 173 (1-2): 1-2 2. Butterwoeths, H. 1987. Feeding of Non Ruminant Livestock. Elsevier: Nottingham 3. Practical guide book 4. National and international journals 5. Scientific articles 					
Supporting lecturer						
Required Courses	-					
Week 2-	Final ability of each learning stage (Sub-CLO)	Evaluation		Form of Learning; Learning methods; Student Assignments; [Estimated Time]	Study Materials (Learning materials)	Assessment Credit (%)
		Indicator	Criteria and Techniques			

(1)	(2)	(3)	(4)	Asynchronous (5)	Synchronous (6)	(7)	(8)
1 & 2	<p>Sub-CLO1:</p> <p>After taking this lecture, students will be able to explain the types, methods of administration and nutrient content of non-ruminant livestock feed (poultry, rabbits, horses and pigs).</p>	<p>a. Accuracy in explaining the basic science of non-ruminant livestock nutrition (poultry, rabbits, horses and pigs)</p> <p>b. Accuracy in explaining the types of non-ruminant feed</p> <p>c. Accuracy in explaining the nutrient content of non-ruminant livestock feed</p>	<p>Criteria: -</p> <p>Technique: Non-Test</p>	<p>KM+PT (1 week x 2 credits x 120 minutes)</p> <p>Activity: 1. Attendance absence 2. Download and read the Syllabus (RPS), Learning Implementation Plan (SAP), Course Agreement, and Learning Materials.</p> <p>Learning methods: <i>Self-Paced Learning</i></p> <p>Mode (Learning Management System): class.usu.ac.id</p>	<p>TM (1 week x 2 credits x 50 minutes)</p> <p>Activity: 1. <i>Offline Learning</i> 2. <i>Class Discussion</i> 3. <i>Note Taking</i></p> <p>Media: 1. <i>Power Point Presentation</i> 2. <i>Text Book</i></p> <p>Learning methods: 1. <i>Lecturer</i> 2. <i>Discussion</i> 3. <i>Self-Paced</i></p>	<p>Subject: 1. Study Contract 2. Overview and scope of the course non-ruminant animal nutrition science 3. Types of non-ruminant feed 4. Ideal nutrient content for non-ruminant livestock</p>	<p>This Sub CLO will be assessed during the MID TERM EXAM with a MID TERM EXAM assessment Crediting of 20%.</p>
3, 4, 5 & 6	<p>Sub-CLO 2:</p> <p>After taking this lecture, students will be able to explain the digestion and metabolism of nutrients (carbohydrates, fats and proteins)</p>	<p>1. Accuracy in explaining the digestive system of non-ruminant livestock (poultry, rabbits, horses and pigs)</p> <p>2. Accuracy in explaining feeding strategies</p>	<p>Criteria: Assessment rubric.</p> <p>Technique: <i>Test:</i> <i>Quiz</i> <i>Assignments</i></p>	<p>KM+PT (1 week x 2 credits x 120 minutes)</p> <p>Activity: 1. Attendance absence 2. Download and read the Syllabus (RPS), Learning Implementation Plan (SAP), Course</p>	<p>TM (1 week x 2 credits x 50 minutes)</p> <p>Activity: 1. <i>Offline Learning</i> 2. <i>Class Discussion</i> 3. <i>Note Taking</i></p> <p>Media:</p>	<p>Subject: 1. Digestive system of non-ruminants (poultry, rabbits, horses and pigs)</p>	<p>This Sub CLO will be assessed during the MID TERM EXAM with a MID TERM EXAM assessment</p>

	<p>in non-ruminant livestock.</p>	<p>(serving and frequency)</p> <ol style="list-style-type: none"> 3. Accuracy in explaining carbohydrate metabolism 4. Accuracy in explaining protein metabolism 5. Accuracy in explaining fat metabolism 		<p>Agreement, and Learning Materials.</p> <ol style="list-style-type: none"> 3. Responding to the opening question 4. Review of the 2nd meeting material 5. Quiz 6. Task <p>Quiz 1: Quiz to measure students' understanding at meetings 1-6</p> <p>Case Method 1:</p> <ol style="list-style-type: none"> 1. Divide the groups evenly (the lecturer divides) 2. Create a paper on the requirements for hatching eggs, a maximum of 15 pages from the table of contents to the bibliography, TMR font size 12, 	<p>1. Power Point Presentation 2. Text Book</p> <p>Learning methods:</p> <ol style="list-style-type: none"> 1. Lecturer 2. Discussion 3. Self-Paced 	<ol style="list-style-type: none"> 2. Feeding strategies include: <ul style="list-style-type: none"> - Presentation - Frequency of administration 3. Carbohydrate metabolism includes the processes of glycolysis, glycogenesis, glycogenolysis, pyruvate oxidation 4. Evaluation of non-ruminant livestock feed protein 5. Amino acids in feed 6. Amino acid metabolism 	<p>Crediting of 20%.</p> <p>Quiz 1: 5%</p>
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				<p>1.5 spacing, sent in PDF format.</p> <p>3.Group presentation</p> <p>Mode (Learning Management System): class.usu.ac.id</p>		<p>in non-ruminant feeds (poultry, rabbits, horses and pigs)</p> <p>7. Lipid (fat) metabolism process</p>	
7	<p>Sub-CLO 3:</p> <p>After taking this lecture, students will be able to explain the assessment of the quality of animal feed ingredients.</p>	<p>Accuracy in explaining the assessment of the quality of animal feed ingredients</p>	<p>Criteria: Assessment rubric.</p> <p>Technique: <i>Non-Test:</i></p>	<p>KM+PT (1 week x 2 credits x 120 minutes)</p> <p>Activity:</p> <ol style="list-style-type: none"> 1. Attendance absence 2. Download and read the Syllabus (RPS), Learning Implementation Plan (SAP), Course Agreement and Learning Materials 3. Responding to the opening question 4. Review of the 6th meeting material <p>Mode (Learning Management System):</p>	<p>TM (1 week x 2 credits x 50 minutes)</p> <p>Activity:</p> <ol style="list-style-type: none"> 1. <i>Offline Learning</i> 2. <i>Class Discussion</i> 3. <i>Note Taking</i> <p>Media:</p> <ol style="list-style-type: none"> 1. <i>Power Point Presentation</i> 2. <i>Text Book</i> <p>Learning methods:</p> <ol style="list-style-type: none"> 1. <i>Lecturer</i> 2. <i>Discussion</i> 3. <i>Self-Paced</i> 	<p>Subject:</p> <ol style="list-style-type: none"> 1. Feed quality assessment 	<p>This Sub CLO will be assessed during the MID TERM EXAM with a MID TERM EXAM assessment Crediting of 20%.</p>

8	MID SEMESTER EXAMINATION						20%
9, 10 & 11	<p>Sub-CLO 4:</p> <p>After taking this course, students will be able to explain feed processing technology (chemical, physical and biological)</p>	<p>a. Accuracy in explaining chemical feed processing technology</p> <p>b. Accuracy in explaining physical feed processing technology</p> <p>c. Accuracy in explaining biological feed processing technology</p>	<p>Criteria: Assessment rubric.</p> <p>Technique: <i>Test:</i></p> <ul style="list-style-type: none"> - Quiz - Case Method 	<p>KM+PT (1 week x 2 credits x 120 minutes)</p> <p>Activity:</p> <ol style="list-style-type: none"> 1. Attendance absence 2. Download and read the Syllabus (RPS), Learning Implementation Plan (SAP), Course Agreement, and Learning Materials. 3. Responding to the opening question 4. Review of mid-term exam questions 5. Quiz 6. Task <p>Quiz 2: Quiz to measure students' understanding of feed processing technology (chemical, physical and biological)</p> <p>Case Method:</p>	<p>TM (1 week x 2 credits x 50 minutes)</p> <p>Activity:</p> <ol style="list-style-type: none"> 1. <i>Offline Learning</i> 2. <i>Class Discussion</i> 3. <i>Note Taking</i> <p>Media:</p> <ol style="list-style-type: none"> 1. <i>Power Point Presentation</i> 2. <i>Text Book</i> <p>Learning methods:</p> <ol style="list-style-type: none"> 1. <i>Lecturer</i> 2. <i>Discussion</i> 3. <i>Self-Paced</i> 	<p>Subject:</p> <ol style="list-style-type: none"> 1. Chemical processing of non-ruminant feed 2. Physical processing of non-ruminant feed 3. Biological processing of non-ruminant feed 	<p>This Sub CLO will be assessed during the FINAL EXAM with a FINAL EXAM assessment Crediting of 20%.</p> <p><i>Quiz</i>10%</p>

				<p>Divide the groups evenly (the lecturer divides)</p> <p>Create a hatchery management paper with a maximum of 15 pages from the table of contents to the bibliography, TMR font size 12, 1.5 spacing, sent in PDF format.</p> <p>Mode (Learning Management System): class.usu.ac.id</p>			
12, 13, 14 & 15	<p>Sub-CLO 5: After taking this course, students will be able to evaluate the adequacy of nutrients for non-ruminant livestock.</p> <p>Sub-CLO 6: After taking this course, students will be able to prepare rations for non-ruminant</p>	<ol style="list-style-type: none"> 1. Accuracy in explaining the evaluation of the adequacy of poultry nutrients 2. Accuracy in preparing rations for non-ruminant livestock needs by utilizing agricultural waste 	<p>Criteria: Assessment rubric.</p> <p>Technique: <i>Non-Test:</i></p>	<p>KM+PT (1 week x 2 credits x 120 minutes)</p> <p>Activity:</p> <ol style="list-style-type: none"> 1. Attendance absence 2. Download and read the Syllabus (RPS), Learning Implementation Plan (SAP), Course Agreement, and Learning Materials. 3. Responding to the opening question 	<p>TM (1 week x 2 credits x 50 minutes)</p> <p>Activity:</p> <ol style="list-style-type: none"> 1. <i>Offline Learning</i> 2. <i>Class Discussion</i> 3. <i>Note Taking</i> <p>Media:</p> <ol style="list-style-type: none"> 1. <i>Power Point Presentation</i> 2. <i>Text Book</i> <p>Learning methods:</p>	<p>Subject:</p> <ol style="list-style-type: none"> 1. Preparation and evaluation of the adequacy of poultry nutrients 2. Preparation and evaluation of nutritional adequacy of rabbit livestock 3. Preparation and evaluation of 	<p>This Sub CLO will be assessed during the FINAL EXAM with a FINAL EXAM assessment Crediting of 20%.</p>

	livestock needs by utilizing agricultural waste.			4. Review of materials from meetings 11, 12, 13 and 14 Mode (Learning Management System): class.usu.ac.id	1. <i>Lecturer</i> 2. <i>Discussion</i> 3. <i>Self-Paced</i>	the adequacy of horse livestock nutrients 4. Preparation and evaluation of pig nutrient adequacy	
16	FINAL SEMESTER EXAMINATION						20%

Assessment Design:

CLO Code and Percentage	Sub-CLO Code	Evaluation Form	Percentage (%)	Total	Implementation of Evaluation
CLO0326 (25%)	Sub-CLO1	MID TERM EXAM	10	27.5	Week 8
	Sub-CLO2	Quiz	5		Week 3
	Sub-CLO3	Project Based Learning	12.5		Week 6
CLO0623(25%)	Sub-CLO1	MID TERM EXAM	10	27.5	Week 8
	Sub-CLO2	Quiz	5		Week 8
	Sub-CLO3	Project Based Learning	12.5		Week 8
CLO0913 (25%)	Sub-CLO4	Project Based Learning	12.5	12.5	Week 11
CLO1127(25%)	Sub-CLO5	Project Based Learning	12.5	22.5	Week 15

	Sub-CLO6	FINAL EXAM	20		Week 15
Total			100%	100%	



Assessment Plan:

Evaluation Form	Sub-CLO	Assessment Instrument [Frequency]		Invoice (proof)	Assessment Credit (%)
		Formative	Summative		
Quiz/Q&A	Sub-CLO2 and Sub-CLO4	Assessment rubric [2 times]	-	Quiz answers uploaded to kelas.usu.ac.id	5
Assignment	Sub-CLO4	Assessment rubric [2 times]	-	Assignment answers uploaded to kelas.usu.ac.id	5
Project Based Learning	Sub-CLO2 and Sub-CLO4	Feedback results case analysis [3 times]	Assessment rubric [2 times]	Logbook/worksheet/slides uploaded to kelas.usu.ac.id	30
Case Method	Sub-CLO2 and Sub-CLO4	Feedback results case analysis [2 times]	Assessment rubric [2 times]	Logbook/worksheet/slides uploaded to kelas.usu.ac.id	20
Written exam 1 (MID TERM EXAM)	Sub-CLO1, Sub-CLO2 and Sub-CLO3	-	Assessment rubric [1 time]	Written exam result sheet	20
Written exam 2 (FINAL EXAM)	Sub-CLO4, Sub-CLO5 and Sub-CLO6	-	Assessment rubric [1 time]	Written exam result sheet	20
Total					100%

Explanation:

- a) Quiz 5%

During the semester there will be 2 quizzes held in class. The quizzes will be conducted via e-learning and have been scheduled in advance. The material being tested is announced by the lecturer and written in the RPS.

b) Assignment 5%

During the semester there will be 1 structured assignments. The assignment given is an effort to add insight by making a resume related to the material written in the RPS.

c) Project-based learning 30%

During the semester there will be case methods, each student will make a paper and report on each case method in groups. Project based learning in this course is conducted 1 times. The papers that have been made will be presented by students. Students will be assessed according to their participation in the presentation and accuracy in the presentation, as well as their participation in the question and answer session when other groups present.

d) Case Method 20%

During the semester there will be case methods, each student will make a paper and report on each case method in groups. Case method in this course is conducted 1 time. The papers that have been made will be presented by students. Students will be assessed according to their participation in the presentation and accuracy in the presentation, as well as their participation in the question and answer session when other groups present.

e) Mid-semester exam (UTS) (mid-test) 20%

The midterm exam covers all the material that has been covered since the beginning of the semester until the 7th meeting both reading and lectures. This exam is conducted in class with multiple choice, short form, and essay questions.

f) Final-semester exam (UAS) (final-test) 20%

The end-of-semester exam covers all the material that has been covered from the 9th to the 15th meeting, both readings and lectures. This exam is conducted in class with multiple choice, short form, and essay questions.

Post Test Quiz Assessment Rubric (10%)

The Pre/Post test questions consist of 5 essay questions done on one sheet of paper (done 4 times during 1 semester)

Value per question item	Criteria
20	Can answer questions correctly, complete the steps correctly, and completely correct
15	The steps for completing the questions are correct, there are a few errors.
10	Most of the steps in completing the questions are correct, there are many errors.

5	The steps for completing the question are not correct, the question cannot be completed
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***Maximum score = 100 (5 questions x 20 points)**

Minimum score = 25 (5 questions x 5 points)

Quiz score 1: (maximum score is 100) $20 \times \sum \text{nilai per butir soal}$

Quiz score 2: (maximum score is 100) $20 \times \sum \text{nilai per butir soal}$

Total score if you take all post-test quizzes with a perfect score is $200 \times 10\%[\text{quiz percentage}] = 20$

Case Method Group Presentation Assignment Assessment Rubric

Matter	Evaluation criteria				
Contents	Complete, with additional good material (20)	Complete (18)	Same as text book (16)	Not complete, but most of the material is covered (14)	Substantially incomplete (12)
Answering Discussion Questions	Able to answer all questions correctly (20)	Can answer most of the questions correctly but there are some questions that are not answered (18)	Able to answer some questions correctly, some others did not reach the target and there were questions that were not answered (16)	Most of the answers did not reach the target and there were unanswered questions (14)	Can't answer all questions (12)
Presentation	Clear, concise with good flow (20)	Clear, concise with sometimes poor flow (18)	Moderate presentation skills (16)	Presentation stutters (14)	Presentation not working (12)

Group organization	Very good organization, supporting each other's presentations (20)	Good organization (18)	Medium organization, some people are less organized (16)	Lack of organization often results in communication errors (14)	The organization was chaotic so the presentation was very disrupted (12)
Creativity	Very creative without going off target (20)	Creative creates enthusiasm (18)	Occasionally attracts attention (15)	Occasionally attracts attention (13)	Boring, makes you sleepy (11)
TOTAL	100 (Very Good)	90-80 (Very well)	79-70 (Good)	69-50 (Pretty good)	59-40 (Not good)

Information :

The total maximum score is 100. The numbers in brackets are the scores for each criterion. The number 100 will later be accumulated with the percentage of the Presentation Assignment (PjBL) value of 50%.

$100 \times 50\% = 50$ points

There are 4 presentation implementations (case method), so the percentage of the Case Method Group Assignment score for each implementation is: $50\% : 4 = 12.5\%$. Points for each implementation of the Case Method Group Assignment: $100 \times 12.5\% = 12.5$ points.

Essay Exam Assessment Rubric:

Assessment criteria	4 Very good	3 Good	2 Enough	1 Not enough
Understanding the Questions	Understand the question exactly once (25)	Understanding the questions (20)	Not understanding the question fully and correctly (15)	Don't understand the question (10)
Contents	Answers show understanding in-depth understanding of the material being asked and participants integrate	The answers demonstrate understanding of the material being asked and integrate some of the information that has been	The answer shows a lack of understanding of the material being asked and only integrates	The answer shows a lack of understanding of the material being asked so it is unclear and not integrated.

	the information that has been studied and/or assigned to be read during the lecture well and appropriately (25)	studied and/or assigned to be read during the lecture. (20)	a small portion of information that has been studied and/or assigned to be read during lectures. (15)	information that has been studied and/or assigned to be read during lectures. (10)
Clarity of Writing	All written ideas are conveyed well and clearly. (25)	Most of the ideas in the writing are well and clearly conveyed. (20)	Some of the ideas in the writing are conveyed well and clearly. (15)	The ideas in the writing are not conveyed well and clearly. (10)
Clarity of Language	Uses foreign/Indonesian languages well and correctly with minimal grammatical errors and word choices that do not interfere with understanding (25)	Uses foreign/Indonesian languages well and correctly with minimal grammatical errors and word choices that interfere with understanding. (20)	Uses foreign/Indonesian language quite well and correctly with some grammatical errors and word choices (15)	Does not use foreign/Indonesian language properly and correctly because the writing contains many grammatical errors and word choices (10)
Total	81-100 (Very well)	61-80 (Pretty good)	41-60 (Enough)	0-40 (Not enough)

Multiple Choice Exam Scoring Rubric:

Value per question item	Criteria
100/ many questions	Can answer questions correctly

0

The answer is not quite right/does not match the answer key provided.

