COURSE LEARNING PLAN

	UNIVERSITY OF BRAWIJAYA FACULTY OF ANIMAL SCIENCE DEPARTMENT OF ANIMAL SCIENCE UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE LESSON PLAN: Animal Nutrition and Feed Stuff			

Course	Code	Weight (credits)	Semester	Compilation Date
Animal Nutrition and Feed Stuff	PEN60001	4 (3 – 1) credits	Even	August 25, 2020

Authorization	Supervising Lecturer	Head of Undergraduate Study Program of Animal Science	Vice Dean 1
	Prof. Dr. Ir. Siti Chuzaemi, MS.IPU. ASEAN Eng.	Dr. Herly Evanuarini, S.Pt, MP	Dr. Ir. Halim Natsir, S.Pt, MP, IPM, ASEAN Eng

Learning Outcomes (LO)	**LO**
	1. (LO 3) Demonstrate attitudes of friendly and caring about animal welfare and permissible (halal) consumption. 2. (LO 6) Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science. 3. (LO 7) Able to demonstrate independent, quality, and measurable performance (both quality and quantity) effectively, efficiently, and sustainably.
	Course Learning Outcomes (CLO)
	After completing this course the students can: 1. Understand and explain the differences between animal digestive systems and processes. 2. Understand and explain the types, benefits, functions, symptoms of nutritional deficiency (proximate analysis and van soest), basic metabolism of food substances including protein, carbohydrates, fats, vitamins, and minerals. 3. Understand and explain the types of nutrient source feed materials, feed additives, and anti-nutrients, as well as evaluate the physical, chemical, and biological quality of feed materials, 4. Understand the basics of animal feed formulation
Brief Course Description	This course discusses: 1) Understanding and explaining the differences in the animal digestive system and processes 2) Understanding and explaining the types, benefits, functions, symptoms of food deficiency (proximate analysis and van soest), basic metabolism of food substances including protein, carbohydrates, fats, vitamins, and minerals, 3) Understand and explain the types of nutritional feed materials, feed additives, and antinutrients, as well as evaluate the physical, chemical and biological quality of feed materials 4) Understand the basics of animal feed formulation
Topics	1. Introduction, Animal Body and Food Substances 2. Animal Digestive System and Process

	3. Carbohydrates (digestion and metabolism)
	4. Protein (digestion and metabolism)
	5. Fat (digestion and metabolism)
	6. Minerals and vitamins (metabolism)
	7. Anti-Nutritional Factors or Antinutrients
	8. Classification of feed materials (types and characteristics of animal feed materials)
	9. Additive Feed
	10. Feed Quality Assessment
	11. Basic Feed Formulation
References	1. Ilmu Nutrisi Ternak Dasar. 2019. Penerbit: UB Press
	2. McDonald, P., Edwards, R.A., Greenhalgh, J.F.D., Morgan, C.A., Sinclair, L.A. and Wilkinson, R.G. 2010. Animal Nutrition. 7th Edition.
	3. Maynard, L.A, and J. K Loosli.1999. Animal Nutrition. 7th Edition. Mc. Graw=Hill Book Company. New York.
Learning Media	
	1. Powerpoint / 1. Laptop
	2. Book References / 2. LCD
	3. Video
Teaching Team	1. Prof. Dr. Ir. Siti Chuzaemi, MS.IPU. ASEAN Eng.
	2. Hartutik, Prof. Dr. Ir., MP. IPU. ASEAN Eng.
	3. Kusmartono, Prof. Dr. Ir.
	4. Eko Widodo, Dr. Ir. M.Agr.Sc., MSc.
	5. Osfar Sjofjan, Dr. Ir. M.Sc. IPU. ASEAN Eng.
	6. Mashudi, Dr. Ir. M.Agr.Sc. IPM. ASEAN Eng.
	7. Marjuki, Dr. Ir., M.Sc
	8. Irfan H. Djunaidi, Dr. Ir., M.Sc. IPM. ASEAN Eng.
	9. M. Halim Natsir, Dr. Ir. S.Pt., MP. IPM. ASEAN Eng.
	10. Yuli Frita Nuningtyas, S.Pt., MSc. MP
	11. Poespitasari Hazanah N., S.Pt., MP
Prerequisite course	Biochemistry

Week (s)	Sub-Course Learning Outcomes (SCLO)	Indicators	Learning Materials/ Topics	Learning Methods	Criteria & Form of Assessment	Weighted Scores (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Able to understand the components of the body and animal feed	Understand the comparison of body components and animal feed	Introduction, Animal Body and Food Substances	Lectures and discussions	Pretest	5
2	Able to analyze the	Has the ability to analyze the nutrient content	- Analyze nutrient content	Lectures and discussions		5

			- Announce related to the structured assignments			
3	Able to understand the animal digestive system and process	Able to explain the animal digestive system and process	Animal Digestive Systems and Processes	Lectures and discussions		10
4	Able to understand digestion and carbohydrate metabolism	Able to explain digestion and carbohydrate metabolism	Carbohydrates (digestion and metabolism)	Lectures and discussions		10
5	Able to understand digestion and protein metabolism	Able to explain digestion and protein metabolism	Protein (digestion and metabolism)	Lectures and discussions	Structured assignments	10
6	Able to understand digestion and fat metabolism	Able to explain digestion and fat metabolism	Fat (digestion and metabolism)	Lectures and discussions	Quizzes	5
7	Able to understand digestion and Minerals and Vitamins (metabolism)	Able to explain digestion and Minerals and Vitamins (metabolism)	Minerals and Vitamins (metabolism)	Lectures, presentations, and discussions		5
8	**MIDTERM EXAM**					
9	Able to understand anti-nutritional factors in feed materials	Able to explain anti-nutritional factors in feed materials	Anti-Nutritional Factors	Lectures and discussions		5
10	Able to understand feed materials (energy source)	Able to explain feed materials (energy source)	Classification of Feed materials (energy source)	Lectures and discussions		10
11	Able to understand feed materials	Able to explain feed materials (protein source)	Classification of Feed materials (protein source)	Lectures and discussions		10

	(protein source)					
12	Able to understand feed materials (minerals and vitamins source)	Able to explain feed materials (minerals and vitamins source)	Classification of Feed materials (minerals and vitamins source)	Lectures and discussions		10
13	Able to understand the types of feed additives	Able to explain the types of feed additives	Feed Additives	Lectures and discussions	Structured assignments	5
14	Able to understand the method of evaluating feed materials based on physical, chemical, and biological characteristics	Able to evaluate feed materials based on physical, chemical, and biological characteristics	Feed Quality Assessment	Lectures and discussions	Quizzes	5
15	Able to understand the basics of feed formulation	Able to apply the basics of feed formulation	Basics of Feed Formulation	Lectures, presentations, and discussions		5
16	**FINAL EXAM**					

RUBRICS FOR ASSESSMENT

	UNIVERSITY OF BRAWIJAYA FACULTY OF ANIMAL SCIENCE DEPARTMENT OF ANIMAL SCIENCE UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE

Course	Animal Nutrition and Feed Stuff		
Score Level	CLO and PLO	Conversion	PLO Score
PLO 6: Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science CLO 1: Understand and explain the differences between animal digestive systems and processes.			
Very Good (4)	Shows a **comprehensive** understanding of concepts related to the animal digestive system and digestive process in their implementation in the field of animal science	80-100	
Good (3)	Shows a **good** understanding of concepts related to the animal digestive system and the digestive process in their implementation in the field of animal science	70-79.9	
Moderate (2)	Shows an **moderate** understanding of concepts related to the animal digestive system and the digestive process in their implementation in the field of animal science	60-69.9	
Poor(1)	Shows a **lack** of understanding of concepts related to the animal digestive system and the digestive process in their implementation in the field of animal science	<60.9	
Score Level	CLO and PLO	Conversion	PLO Score
PLO 6: Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science PLO 7: Able to demonstrate independent, quality, and measurable performance (both quality and quantity) effectively, efficiently, and sustainably CLO 2: Understand and explain the types, benefits, functions, symptoms of nutritional deficiency (proximate analysis and van soest), basic metabolism of food nutrients including protein, carbohydrates, fats, vitamins, and minerals			
Very good (4)	Shows a **comprehensive** ability to identify and analyze the types, benefits,	80-100	

Score Level	Description	Conversion	PLO Score
	functions, symptoms of nutritional deficiency (proximate analysis and van soest), basic metabolism of food substances including protein, carbohydrates, fats, vitamins, and minerals		
Good (3)	Shows a **good** ability to identify and analyze the types, benefits, functions, symptoms of nutritional deficiency (proximate analysis and van soest), basic metabolism of food substances including protein, carbohydrates, fats, vitamins, and minerals	70-79.9	
Moderate (2)	Shows an **moderate** ability to identify and analyze the types, benefits, functions, symptoms of nutritional deficiency (proximate analysis and van soest), basic metabolism of food substances including protein, carbohydrates, fats, vitamins, and minerals	60-69.9	
Poor (1)	Shows a **poor** ability to identify and analyze the types, benefits, functions, symptoms of nutritional deficiency (proximate analysis and van soest), basic metabolism of food substances including protein, carbohydrates, fats, vitamins, and minerals	<60	
Score Level		Conversion	PLO Score
PLO 3: Demonstrate attitudes of friendly and caring about animal welfare and permissible (halal) consumption. PLO 6: Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science. CLO 3: Understand and explain the types of nutrient source feed materials, feed additives, and anti-nutrients, as well as evaluate the physical, chemical, and biological quality of feed materials			
Very Good (4)	Shows a **comprehensive** understanding of concepts related to types of nutrient source feed materials, feed additives, and anti-nutrients, as well as evaluate the physical, chemical, and biological quality of feed materials,	80-100	

Score Level	CLO and PLO	Conversion	PLO Score
Good (3)	Shows a **good** understanding of concepts related to types of nutrient source feed materials, feed additives, and anti-nutrients, as well as evaluate the physical, chemical, and biological quality of feed materials,	70-79.9	
Moderate (2)	Shows **moderate** understanding of concepts related to types of nutrient source feed materials, feed additives, and anti-nutrients, as well as evaluate the physical, chemical, and biological quality of feed materials,	60-69.9	
Poor (1)	Shows a **poor** understanding of concepts related to types of nutrient source feed materials, feed additives, and anti-nutrients, as well as evaluate the physical, chemical, and biological quality of feed materials,	<60.9	
Score Level	CLO and PLO	Conversion	PLO Score
PLO 3: Demonstrate attitudes of friendly and caring about animal welfare and permissible (halal) consumption. PLO 6: Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science. PLO 7: Able to demonstrate independent, quality, and measurable performance (both quality and quantity) effectively, efficiently, and sustainably. CLO 4: Understand the basics of animal feed formulation			
Very Good(4)	Shows **comprehensive** ability to explain the basics of animal feed formulation based on Pearson's square method and trial and error	80-100	
Good (3)	Shows **good** ability to explain the basics of animal feed formulation based on Pearson's square method and trial and error	70-79.9	
Moderate (2)	Shows **moderate** ability to explain the basics of animal feed formulation based on Pearson's square method and trial and error	60-69.9	
Poor(1)	Shows **poor** ability to explain the basics of animal feed formulation based on Pearson's square method and trial and error	<60.9	

How to Calculate the PLO Score : $\frac{Score\ Level}{\sum Score\ Level} \times \frac{\sum CLO}{\sum PLO} \frac{Score\ Level}{\sum Score\ Level} \times \frac{\sum CLO}{\sum PLO}$

Calculation of CLO Score

Components assessed	Component Weights	CLO Weight against Score			
		CLO 1	CLO 2	CLO 3	CLO 4
Practicum	0.2	0.15	0.4	0.3	0.15
Midterm Exam	0.35	0.4	0.6		
Final Exam	0.35			0.7	0.3
Structured Assignments	0.05	0.5		0.5	
Quizzes	0.05		0.5		0.5

Calculation of PLO Score

CLO	CLO Score	CLO Weight	PLO		
			PLO 3	PLO 6	PLO 7
CLO 1				1	
CLO 2				0.7	0.3
CLO 3			0.3	0.7	
CLO 4			0.3	0.5	0.2

	UNIVERSITY OF BRAWIJAYA **FACULTY OF ANIMAL SCIENCE** **STUDY PROGRAM OF ANIMAL SCIENCE**		
Course: Animal Nutrition and Feed Stuff	Code: PEN60001	RMK :	Semester: 2 (Two)
Lecturer	1. Siti Chuzaemi, Prof. Dr. Ir., MP. IPU. ASEAN Eng. 2. Hartutik, Prof. Dr. Ir., MP. IPU. ASEAN Eng. 3. Kusmartono, Prof. Dr. Ir. 4. Mashudi, Dr. Ir. M.Agr.Sc. IPM. ASEAN Eng. 5. Eko Widodo, Dr. Ir. M.Agr.Sc., MSc. 6. Osfar Sjofjan, Dr. Ir. M.Sc. IPU. ASEAN Eng. 7. Marjuki, Dr. Ir., M.Sc 8. M. Halim Natsir, Dr. Ir. S.Pt., MP. IPM. ASEAN Eng. 9. Irfan H. Djunaidi, Dr. Ir., M.Sc. IPM. ASEAN Eng. 10. Poespitasari Hazanah N., S.Pt., MP 11. Yuli Frita Nuningtyas, S.Pt., MSc. MP		

Introduction (Describe the explanation needed about this course, experiences that have been done)

This course discusses: 1) Understanding and explaining the differences in the animal digestive system and processes 2) Understanding and explaining the types, benefits, functions, symptoms of food deficiency (proximate analysis and van soest), basic metabolism of food nutrients including protein, carbohydrates, fats, vitamins, and minerals, 3) Understand and explain the types of nutrient source feed materials, feed additives, and antinutrients, as well as evaluate the physical, chemical and biological quality of feed materials, 4) Understand the basics of animal feed formulation

1	**Objectives** (Describe the objectives of general and specific course)
	After completing this course students can: 1. Understand and explain the differences between animal digestive systems and processes. 2. Understand and explain the types, benefits, functions, symptoms of nutritional deficiency (proximate analysis and van soest), basic metabolism of food substances including protein, carbohydrates, fats, vitamins, and minerals. 3. Understand and explain the types of nutrient source feed materials, feed additives, and anti-nutrients, as well as evaluate the physical, chemical, and biological quality of feed materials 4. Understand the basics of animal feed formulation
2	**Learning Strategies** (Describe the strategies used to achieve course objectives - CLO)
	The learning strategy of this course is through a combination of *Teacher-Centered Learning (TCL)* and *Student-Centered Learning (SCL)*.

3	**Lecture Management** (Describe the management of lectures: lectures, tutorials, practicum, assignments, quizzes)
	The learning methods applied in this course are face-to-face learning, student presentations, small group discussions, independent assignments, and practicum.
4	**Lecture Contents** (explain their suitability with the applicable curriculum)
	1. Introduction, Animal Body and Food Substances 2. Animal Digestive System and Process 3. Carbohydrates (digestion and metabolism) 4. Protein (digestion and metabolism) 5. Fat (digestion and metabolism) 6. Minerals and vitamins (metabolism) 7. Anti-Nutritional Factors or Antinutrients 8. Classification of feed materials (types and characteristics of animal feed materials) 9. Additive Feed 10. Feed Quality Assessment 11. Basic Feed Formulation The lecture content is based on the semester program plan and learning activities.
5	**Lecture Participants** (provide an overview of the participants)
	The lecture participants are all students in semester 2 (two) of the Faculty of Animal Science, University of Brawijaya who have taken the biochemistry course.
6	**Percentage of Attendance** (% attendance of lecturers;% attendance of students)
	Lectures are consist of: - Total lecturer attendance is 100% - 16 meetings and minimum student attendance 80%.
7	**Evaluation System** (explain homework, quizzes, group assignments, practicum, etc.)
	The evaluation system for this course is face-to-face learning, structured assignments, student presentations, small group discussions, independent assignments, and practicum.
8	**Class Observation** (explain important and interesting things encountered during the lecture)
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9	**Learning Outcomes** (explain the achievement of the objectives that have been set and include the learning outcomes that can be explained)
	The learning outcomes in this course are: 1. (LO 3) Demonstrate attitudes of friendly and caring about animal welfare and permissible (halal) consumption s. 2. (LO 6) Able to apply biological science, physiology, nutrition science, breeding science, animal raising management to comprehend the concept and implement it in the field of animal science 3. (LO 7) Able to demonstrate independent, quality, and measurable performance (both quality and quantity) effectively, efficiently, and sustainably.
10	**Obstacles** (give an overview of the main barriers to learning)
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11	**Distribution of score** (provide the distribution of score following the learning outcomes of this course)

	Learning outcomes include:
	  1. Practicum (20 %)
	  2. Midterm Exam (35%)
	  3. Final Exam (35%)
	  4. Assignments (5%)
	  5. Quizzes (5%)

12	**Conclusion**
13	**Recommended Improvement**
	Appendices:
	1. attendance sheets 2. CPL-PLO graphs Etc.

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