| UNIVERSITY OF BRAWIJAYA |
| FACULTY OF ANIMAL SCIENCE |
| DEPARTMENT OF ANIMAL SCIENCE |
| UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE |
| LESSON PLAN - INTEGRATED FARMING SYSTEM |

Course	Code	Weight (credits)	Semester	Compilation Date
Integrated Farming System	PEN60006	3 (2-1)	4 (Fourth)	January 15, 2020

Authorization	Supervising Lecturer	Head of Undergraduate Study Program of Animal Science	Vice Dean 1
	Prof. Dr. Ir. Ifar Subagiyo, M.Agr.St	Dr. Herly Evanuarini,S.Pt. gtMP	Dr. M. Halim Natsir,S.Pt.MP,IPM,ASEAN Eng

Learning Outcomes (LO)	LO
	1. LO 4: Able to develop comprehensive insight and mindset according to the science and field of the animal industry
	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
	4. LO 13: Able to apply animal technology that is oriented towards improving production, efficiency, quality, and sustainability based on mastery of animal science including breeding, feed, processing of products, marketing management and organizing a sustainable animal production system, and applying entrepreneurial concepts
	CLO
	After completing this course the students can:
	1. Explain the concept of crop-animal integration to produce ASUH (Safe, Hygiene, Wholesome, and Halal) animal products and preserve the environment (CLO 4, CLO 6)
	2. Analyze various integrated farming systems (integration with agriculture, plantation, forestry, especially for tropical regions (CLO 6, CLO 7)

	3. Able to design the model of sustainable integrated farming systems (CLO 7, CLO 13)
Brief Course Description	This course studies the concept of systems and interactions between sub-systems in integrated farming systems, studies various kinds of integrated farming systems, and analyzes sustainable integrated farming systems.
Topics	1. Introduction (Definition of Integrated Farming System and an Overview of Integrated Farming Systems) 2. Systems Concept/Theory (Components, interactions, structures, hierarchies) 3. Mixed Farming Systems (Definition, advantages and disadvantages and technology used) 4. Integration of forage crops in the crop-animal integration system 5. Three-stratum system 6. Animal grazing systems in coconut/oil palm plantations 7. Integrated farming systems: Agroforestry (Alley cropping, silvopasture, riparian forest buffer, windbreak, forest farming) 8. Sustainable farming 9. Organic Farming 10. Techno-ecological Farming Model
References	

Learning Media	Software	Hardware

Teaching Team	1. Prof.Dr. Ir. Hendrawan S.,M.Rur.Sc 2. Prof. Dr. Ir. Ifar Subagiyo, M.Agr.St 3. Prof.Dr. Ir. Kusmartono 4. Dr.Ir. Siti Nurul Kamaliyah,MP 5. Dr.Ir. Mashudi,M.Agr.Sc,IPM 6. Dr. Ir. Herni Sudarwati, MS 7. Ir. Hanief Eko Sulistyo,MP 8. Ir. Hermanto,MP 9. Artharini Irsyammawati,S.Pt.MP 10. Rini Dwi Wahyuni,S.Pt., M.Sc

Prerequisite course		Biology, ITPT				

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 explain an overview of integrated farming system	Able to provide an overview of the integrated agricultural system	INTRODUCTION Lecture Contract, Semester Lesson Plan (RPS) - Definition of an integrated farming system - Overview of integrated farming system	-Lectures	Midterm Exam	
2	Able to explain the concept/ theory of integrated farming systems	Able to explain the system concept in an integrated farming system	Concept/theory of integrated farming systems System components -System interactions -System structure and hierarchy -Classification system	-Lectures -Discussion	Midterm Exam	
3	Able to explain mixed farming systems	Able to explain the advantages and disadvantages as well as the technology used in mixed farming systems	Mixed Farming Systems Definition of mixed farming systems -Advantages and disadvantages -Technology used	- Lectures -Discussion	Midterm Exam	
4	Able to explain the integration of forage plants in the crop-animal	Able to explain an example of the integration of forage crops in a crop-animal system	Integration of forage crops in crop-animal systems -Background -Advantages and disadvantages -Examples of crop integration	-Lectures -Discussion	Midterm Exam	

	integration system				
5	Able to explain the three-strata system model	Able to explain/provide examples of the three-stratum system model.	Integration of forage crops in crop-animal systems -Three strata system	-Lectures -Discussion	Midterm Exam and quizzes
6	Able to analyze pasture and animal integration models in coconut plantations	Able to analyze the pasture and animal integration models in coconut plantations	Integration of forage crops in crop-animal systems - Pasture and Animal in coconut plantations	-Lectures -Discussion	Midterm Exam
7	Able to evaluate alley cropping and silvopasture integration models	Able to analyze alley cropping and silvopasture integration models	Integration of forage crops in crop-animal systems -Alley cropping dan silvopasture	-Lectures -Discussion	Midterm Exam
8	MIDTERM EXAM				
9	Able to evaluate Riparian forest buffer integration models	Able to analyze Riparian forest buffer integration models	Integration of forage crops in crop-animal systems -Riparian forest buffer	-Lectures -Discussion	Final Exam
10	Able to evaluate windbreak and forest farming integration models	Able to analyze windbreak and forest farming integration models	Integration of forage crops in crop-animal systems - windbreak dan forest farming	-Lectures -Discussion	Final Exam
11	Able to explain the concept of	Can explain the concept of	Sustainable farming - Definition of Sustainability	-Lectures -Discussion	Final Exam

	sustainability in the farming business.	sustainability in the farming business.	-The concept of sustainability in the farming business			
12	Able to explain organic farming	Can provide an example of organic farming	Sustainable farming Model Pertanian T-Organic farming	-Lectures -Discussion	Final Exam	
13	Able to explain the concept of a techno-ecological farming model	Can explain the concept of a techno-ecological farming model	Techno-Ecological Farming Model - Understanding Techno-ecological Agriculture - Characteristics and shaping factors of the techno-ecological farming model -Benefits of techno-ecological farming -Steps to develop techno-ecological farming	-Lectures -Discussion	Final Exam	
14	Able to think critically, work in groups, and convey ideas	Can work together in groups and present the results.	Discussion / Group Presentation	Discussion	Final Exam and Structured Assignments	
15	Able to think critically, work in groups, and convey ideas	Can work together in groups and present the results.	Discussion / Group Presentation	Discussion	Final Exam	
16	FINAL EXAM					

RUBRICS FOR ASSESSMENT

	UNIVERSITY OF BRAWIJAYA FACULTY OF ANIMAL SCIENCE DEPARTMENT OF ANIMAL SCIENCE UNDERGRADUATE STUDY PROGRAM OF ANIMAL SCIENCE		
Course	Integrated Farming System		
Score Level	CLO and PLO	Conversion	PLO score
PLO ….: PLO 4: Able to develop comprehensive insight and mindset according to the science and field of the animal industry 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 ...: CLO 1: Explain the concept of crop-livestock integration to produce ASUH (Safe, Hygiene, Wholesome, and Halal) livestock products and preserve the environment			
Very Good (4)	Able to explain the concept of crop-animal integration to produce ASUH (Safe, Hygiene, Wholesome, and Halal) animal products and preserve environmental sustainability **very well**	80-100	
Good (3)	Able to explain the concept of crop-animal integration to produce ASUH (Safe, Hygiene, Wholesome, and	70-79	

	Halal) livestock products and preserve environmental sustainability **properly**		
Moderate (2)	Able to explain the concept of crop-animal integration to produce ASUH (Safe, Hygiene, Wholesome, and Halal) animal products and preserve environmental sustainability **quite well**	60-69	
Poor (1)	Able to explain the concept of crop-animal integration to produce ASUH (Safe, Hygiene, Wholesome, and Halal) animal products and preserve environmental sustainability **poorly**	<60	
Score Level	CLO and PLO	Conversion	PLO Score
PLO….: 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 ...: CLO 2: Analyze various integrated farming systems (integration with agriculture, plantation, forestry, especially for tropical regions			
Very Good (4)	Able to analyze various integrated farming systems (integration with agriculture, plantation, forestry, especially for tropical regions **very well**	80-100	
Good (3)	Able to analyze various integrated farming systems (integration with	70-79	

Score Level	CLO and PLO	Conversion	PLO Score
	agriculture, plantation, forestry, especially for tropical regions **properly**		
Moderate (2)	Able to analyze various integrated farming systems (integration with agriculture, plantation, forestry, especially for tropical regions **quite well**	60-69	
Poor (1)	Able to analyze various integrated farming systems (integration with agriculture, plantation, forestry, especially for tropical regions **poorly**	<60	
Score Level	CLO and PLO	Conversion	PLO Score
PLO ….: PLO 7: Able to demonstrate independent, quality, and measurable performance (both quality and quantity) effectively, efficiently, and sustainably PLO 13: Able to apply animal technology that is oriented towards improving production, efficiency, quality, and sustainability based on mastery of animal science including breeding, feed, processing of products, marketing management and organizing a sustainable animal production system, and applying entrepreneurial concepts CLO ...: CLO 3: Able to design a model of sustainable integrated farming systems			
Very Good (4)	Able to design a model of sustainable integrated farming systems **very well**	80-100	
Good (3)	Able to design a model of sustainable integrated farming systems **properly**	70-79	
Moderate (2)	Able to design a model of sustainable integrated farming systems **quite well**	60-69	
Poor (1)	Able to design a model of sustainable integrated farming systems **poorly**	<60	

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

Calculation of CLO Score

Components assessed	Component Weights	CLO Weight against Score		
		CLO 1	CLO 2	CLO 3
Practicum	0.3		0.4	0.6
Midterm Exam	0.3	0.6	0.4	
Final Exam	0.3		0.6	0.4
Assignments	0.05		0.6	0.4
Quizzes	0.05	0.5	0.5	
CLO WEIGHT				

<mark>The orange one must be filled by the supervisory team</mark>

Filling Steps:

1. Components of assessment = any components that will be assessed in one course (For example, Midterm exam, Final Exam, Presentation, Quizzes, etc)

2. Component Weights = Determine the weight of each component where the total of all components is 1.

3. CLO Weight against Score

a. Show the number of CLO in each course (for example, the animal feed industry course has 4 CLO).

b. Determine the component of assessment aims to achieve any CLO number

c. The total weight of the CLO score for each component is 1

Calculation of PLO Score

CLO	CLO Score	CLO Weight	PLO			
			PLO 4	PLO 6	PLO 7	PLO 13
CLO 1			0.4	0.6		
CLO 2				0.5	0.5	
CLO 3					0.4	0.6

The orange one must be filled by the supervisory team

Filling Steps:

1. CLO= Jot down the number of CLO for each course (refer to the previous table)

2. PLO= Jot down the number of PLO in each course based on the Semester Lesson Plan (RPS)

3. PLO weight

   a. Show the number of PLO in each course (for example, the animal feed industry course has 3 PLO).

   b. Determine the component of assessment aims to achieve any PLO number

   c. The total weight of the PLO score for each component is 1

Lecture Portfolio

	UNIVERSITY OF BRAWIJAYA **FACULTY OF ANIMAL SCIENCE** **STUDY PROGRAM OF ANIMAL SCIENCE**		
Course: Integrated Farming System	Code: PEN60006	RMK :	Semester: 4 (Four)
Lecturer	1. Prof.Dr. Ir. Hendrawan S.,M.Rur.Sc 2. Prof. Dr. Ir. Ifar Subagiyo, M.Agr.St 3. Prof.Dr. Ir. Kusmartono 4. Dr.Ir. Siti Nurul Kamaliyah,MP 5. Dr.Ir. Mashudi,M.Agr.Sc,IPM 6. Ir. Hanief Eko Sulistyo,MP 7. Dr.Ir. Herni Sudarwati,MS 8. Ir. Hermanto,MP 9. Artharini Irsyammawati,S.Pt.MP 10. Rini Dwi Wahyuni,S.Pt.M.Sc		
Introduction (Describe the explanation needed about this course, experiences that have been done)			

This course studies the concept of systems and interactions between sub-systems in integrated farming systems, studies various kinds of integrated farming systems, and analyzes sustainable integrated farming systems.

1	**Objectives** (Describe the objectives of general and specific course)
	The objectives of the Integrated Farming System is: 1. Explain the concept of crop-livestock integration to produce ASUH (Safe, Hygiene, Wholesome, and Halal) livestock products and preserve the environment (PLO 4, PLO 6) 2. Analyze various integrated farming systems (integration with agriculture, plantation, forestry, especially for tropical regions (PLO 6, PLO 7) 3. Able to design the model of sustainable integrated farming systems (PLO 7, PLO 13)
2	**Learning Strategies** (Describe the strategies used to achieve course objectives - CLO)
	Learning Strategy of animal biochemistry 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, etc)
	The learning methods applied in this animal biochemistry course is face-to-face learning, student presentations, small group discussions, independent assignments, and practicum.
4	**Lecture Contents** (explain their suitability with the applicable curriculum)
	The main topic in Integrated Farming System is: 1. Introduction (Definition of Integrated Farming System and an Overview of Integrated Farming Systems) 2. Systems Concept/Theory (Components, interactions, structures, hierarchies) 3. Mixed Farming Systems (Definition, advantages and disadvantages and technology used)

		4. Integration of forage crops in the crop-livestock integration system 5. Three-stratum system 6. Livestock grazing systems in coconut/oil palm plantations 7. Integrated farming systems: Agroforestry (Alley cropping, silvopasture, riparian forest buffer, windbreak, forest farming) 8. Sustainable farming 9. Organic Farming 10. Techno-ecological FarmingModel
5	**Lecture Participants** (describe the participants)	
	The participants of the Integrated Farming System are all students in semester 4 (four) of the Faculty of Animal Science and who have taken the courses of Biology and Forage Science.	
6	**Percentage of Attendance** (% attendance of lecturers;% attendance of students)	
	1) Lecturer attendance 100% 2) Lecture: Duration 100 minutes/meeting (14 meetings) 3) Practicum 50 minutes/meeting (14 meetings) 4) Structured Assignments/Quizzes/Group Presentation 5) Attendance: 80 % of the total attendance	
7	**Evaluation System** (explain homework, quizzes, group assignments, practicum, etc.)	
	Midterm Exam: 30% Final Exam:30 % Pass the Practicum Exam:30 % Structured Assignments/Quizzes:10%	
8	**Class Observation** (explain important and interesting things encountered during the lecture)	
9	**Learning Outcomes** (explain the achievement of the objectives that have been set and include the learning outcomes that can be explained)	
	Learning outcomes of the Integrated Farming System course are:	

	1. Able to develop insight and comprehensive mindset in accordance with the science and field of the animal industry 2. Able to master Biology, Physiology, Nutritional Science, Breeding Science, and Animal Farming Management to understand the concept and implementation in the field of animal science 3. Able to show independent, quality, and measurable performance (both quality and quantity), effective, efficient, and sustainable 4. Able to apply animal technology oriented to increasing production, efficiency, quality, and sustainability based on mastery of animal science which includes breeding, feed, product processing, marketing management, and organizing a sustainable animal production system and applying the concept of entrepreneurship
10	**Obstacles** (Describes the main barriers to learning)
11	**Distribution of score** (provide the distribution of score following the learning outcomes of this course)
	Midterm Exam: 30% Final Exam:30 % Pass the Practicum Exam:30 % Structured Assignments/Quizzes:10%
12	**Conclusion**
13	**Recommended Improvement**
	Appendices:
	1. 2. Etc.