

SEMESTER COURSE PLAN (SCP)

ENVIROMENTAL SCIENCE OF LIVESTOCK
(23101120303)



TEACHING TEAM :

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BACHELOR PROGRAMME IN ANIMAL HUSBANDRY
FACULTY OF ANIMAL SCIENCE
HASANUDDIN UNIVERSITY
MAKASSAR
2025

**BACHELOR PROGRAMME IN ANIMAL HUSBANDRY
FACULTY OF ANIMAL SCIENCE
HASANUDDIN UNIVERSITY**

Vision

Vision of the study program :

Becoming an international standard in livestock education provider based on the Indonesian Maritime Continent

Vision Strategic

In accordance with the vision, mission, and objectives that have been set, the Animal Husbandry Study Program of the Faculty of Animal Science sets the following objectives to be achieved:

- a. Improving the quality of learning implementation that is in line with the needs of industry and society based on research and international standards;
- b. Creating networks and partnerships in the development of Animal Husbandry science and technology and its utilization in the implementation of learning;
- c. Producing graduates who have character, vision, creativity and innovation in the field of animal husbandry science and technology with an entrepreneurial perspective.

Mission

The mission carried out in the implementation of the Bachelor of Animal Husbandry Study Program, Faculty of Animal Husbandry, Hasanuddin University is

- 1) Organizing quality learning to produce independent and globally competitive Animal Husbandry scholars.
- 2) Developing animal husbandry science for the benefit of the nation.
- 3) Providing a conducive academic climate for implementing education with an entrepreneurial perspective.

Graduate Profiles

No	Profile	Description
1	Manager	Graduates who apply concepts and techniques in managing livestock farming and institutions related to livestock businesses such as financial institutions
2	Young Researcher	Graduates who able to apply scientific concepts and methods in solving problems in the development of the field of Animal Husbandry
3	Planners	Graduates who able to prepare potential and problem analysis, as well as formulate plans and strategies for the development of the livestock and related industries
4	Educators	Graduates who have the ability and skills to transfer science and technology to students in the field of animal husbandry
5	Entrepreneur	Graduates who able to apply business in the field of Animal Husbandry as their main business, or business development to support livestock business
6	Bureaucrat	Graduates who are able to organize government duties, especially in the affairs of livestock development

Learning Outcomes imposed on the Course

ILO-6 (KU3) - Able to be responsible for the achievement of group work results, supervise and evaluate the completion of work assigned to workers under their responsibility

ILO-8 (KK2) - Able to synthesize production systems by integrating the field of Animal Science with other fields of science

Course Learning Outcomes (CLO)

CLO-1: Able to discuss the interaction between livestock (livestock production-reproduction) and environmental factors - especially climatic (global warming issues) and feed availability ()

CLO-2: Able to analyze the immune mechanisms that occur in the body of livestock in response to environmental stress and engineer the approach ()

Sub-CLO

Sub-CLO 1: Able to discuss the concept of evolutionary development of life, suitability of life forms and environmental forms ()

Sub-CLO 2: Able to discuss the concepts of zoogeography, bioclimatology and morphological, anatomical, behavioral and communication adaptations of livestock to the environment (especially hot/tropical) ()

Sub-CLO 3: Able to analyze the adaptation of body temperature and body fluid regulation in livestock in the environment (especially hot/tropical) ()

Sub-CLO 4: Able to apply the concept of adaptation to the reproductive system of livestock (cattle, goats, pigs, poultry) especially in hot-tropical environments ()

Sub-CLO 5: Able to apply the concept of adaptation to dairy livestock production especially in hot/tropical environment ()

Sub-CLO 6: Able to apply the concept of adaptation to the production of egg-laying poultry (chicken - duck) especially in hot/tropical environment ()

Learning Analysis

Livestock Environmental Science



Able to apply the concept of adaptation to the production of egg-laying poultry (chicken - duck) especially in hot/tropical



Able to apply the concept of adaptation to dairy livestock production especially in hot/tropical environments



Able to apply the concept of adaptation to the reproductive system of livestock (cattle, goats, pigs, poultry) especially in tropical-hot



Able to analyze the adaptation of body temperature and body fluid regulation in livestock in their environment (especially hot/tropical)
(CLO-1)



Able to discuss the concepts of zoogeography, bioclimatology and morphological, anatomical, behavioral and communication adaptations of livestock to the environment (especially hot/tropical)
(CLO-1)



Able to discuss the concept of evolutionary development of life, suitability of life forms and environmental forms
(CLO-1)



Have passed the subject Livestock Physiology



**HASANUDDIN UNIVERSITY
FACULTY OF ANIMAL SCIENCE
BACHELOR PROGRAMME IN ANIMAL HUSBANDRY
SEMESTER COURSE PLAN**

Course	Code	Course Group	Credit Points	Semester	Date of Preparation
Environmental Science of Livestock	23101120303	PRODUCTION	3	3	October 10, 2024
Authority	Developer Lecturer		Course Coordinator		Head of study Program
	Prof. Dr. Ir. Herry Sonjaya, DEA Prof. Dr. Ir. Ambo Ako, M.Sc Dr. Ir. Wempie, M.Sc Dr. Hasbi, S.Pt., M.Si. Dr. Sri Gustina Sain, S.Pt., M.Si Aulia Uswa Noor Khasanah, S.Pt.,M .Pt.		Dr. Hasbi, S.Pt., M.Si.		Dr. Agr. Ir. Renny Fatmyah Utamy, S. Pt., M. Agr., IPM
Course Learning Outcomes	ILOs that are imposed on the course				
	ILO-6	Able to be responsible for the achievement of group work results, supervise and evaluate the completion of work assigned to workers under their responsibility.			
	ILO-8	Able to synthesize production systems by integrating the field of Animal Science with other fields of science			
	ILO⇒ Course Learning Outcomes (CLO)				
	Upon completion of this course, it is expected that:				
	CLO⇒ Sub-CLOs				
	SUB-CLO-1	SUB-CLO-1: Able to discuss the concept of evolutionary development of life, the suitability of life forms and environmental forms			
		Able to discuss the concepts of zoogeography, bioclimatology and morphological, anatomical, behavioral and communication adaptations of livestock to the environment (especially hot/tropical)			
SUB-CLO-3: Able to analyze the adaptation of body temperature and body fluid regulation in livestock in the environment (especially hot/tropical)					
CLO-2	SUB-CLO-4: Able to apply the concept of adaptation to the reproductive system of livestock (cattle, goats, pigs, poultry) especially in hot tropical environments				
	SUB-CLO 5: Able to apply the concept of adaptation to dairy livestock production especially in hot/tropical environment				

SUB-CLO-6: Able to apply the concept of adaptation to the production of egg-laying poultry (chicken - duck) especially in hot/tropical environments.

Correlation between ILOs/CLOs to Sub-CLOs

ILOs that are imposed on the course	ILO	SUB CLO	Form Assessment+			Weight	Value	Student Score
			Formative	Summative				
				Quiz	Case Study			
ILO-8	CLO-1	SUB-CLO-1		10	0	0	10	
ILO-8	CLO-1	SUB-CLO-2		0	15	0	15	
ILO-8	CLO-1	SUB-CLO-3		0	0	10	10	
ILO-8	CLO-2	SUB-CLO-4		0	15	0	15	
ILO-8	CLO-2	SUB-CLO-5		0	20	0	20	
ILO-8	CLO-2	SUB-CLO-6		0	15	0	15	
ILO-8	CLO-2	SUB-CLO-7		0	15	0	15	
				10	80	20	100	

Course Description

This course discusses the direct and indirect interactions between livestock (livestock production-reproduction) and biotic and abiotic environmental factors - especially climatic (temperature, humidity, and other climatic factors, including global warming issues) and feed availability - and at the same time describes the structural and functional physiological adaptation mechanisms that occur in the livestock body in response to environmental stress, and creative thinking to engineer the approach.

Learning Materials / Subject Matter

1. Hypothetical evolutionary development of life, and harmony of life forms and environment
2. Concepts of zoogeography, bioclimatology and adaptability in the field of animal husbandry
3. Concepts of morphological and anatomical adaptation of livestock to the environment (especially hot/tropical)
4. Concepts of behavioral adaptation and communication in livestock in their environment (especially in the heat/tropics)
5. The concept of body temperature regulation adaptation in livestock in the environment (especially in hot/tropical)
6. The concept of body fluid regulation in livestock in their environment (especially in heat/tropics).
7. Concept of adaptation of livestock reproductive system (cattle, goats, pigs, poultry) especially in tropical-hot environment. (reproductive performance, endocrine, neuroendocrine, and behavior)
8. the concept of adaptation of dairy livestock (cows/goats) especially in hot/tropical environments to improve their milk production performance (production performance and behavior)
9. the concept of adaptation of egg-laying poultry (chicken - duck) especially in hot/tropical environment to improve their production performance (production performance and behavior).

Reference	Key Reference						
	<ol style="list-style-type: none"> 1. Rahardja, D.P., dan Veronica SriLestari., 2017. Lingkungan Ternak. Modul Pembelajaran, Universitas Terbuka. 2. Lembaga Ilmu Pengetahuan Indonesia, 2014. Kekinian KEanekaragaman Hayati Indonesia. 3. Endah Murniningtyas. Wahjyuningsih Darajati. Efendi S., Sumendi. 2016. Indonesian Biodiversity – Strategy and Action Plan 2015 – 2010. Kementerian Perencanaan Pembangunan Nasional – BAPPENAS. 4. Hall, S.J.G. 2004. Livestock Biodiversity – Genetic Reseources for the Farming of the Future. Blackwell Science, Ltd., India. 5. Storey KB., and Storey JM. 2005. Biochemical Adaptation to Extreme Environments, In: Integrative physiology in the proteomics and post-genomics age, ed. By Walz W., Humana Press Inc.,Totowa, New Jersey 07512. 6. Bess Tiesnamurti dkk. 2011. Rencana Aksi Global Sumber Daya Genetik Ternak dan Deklarasi Interlaken. Pusat Penelitian dan Pengembangan Peternakan. Pusat Penelitian dan Pengembangan Peternakan, Bogor. 7. Faye, B. 2013. Anatomical and physiological adaptation of domestic animals to ecosystem constraints: the example of the camel in arid lands. 8. Collier, R.J., and J.L. Collier (Editor).2012. Environmental Physiology of Livestock. Wiley-Blackwell.UK. 9. Sejian, V., et.al., 2012. Environmental Stress and Amelioration in Livestock Production. Springer, London. 10. Reece, WO., et al. (ed). 2015. Dukes' Physiology of Domestic Animals, USA., UK. 11. Barrett, KE., et al. 2010. Ganong's Review of Medical Physiology, UK 						
	Additional Reference						
	-						
Teaching Team	Prof. Dr. Ir. Ismartoyo, M.Agr.S., Prof. Dr. Ir. Ambo Ako, M.Sc., Prof. Dr. Ir. Sitti Nurani Sirajuddin, S.Pt., M.Si., Dr. Agr. Ir. Renny Fatmyah Utamy, S. Pt., M. Agr., IPM, Dr. Sutomo, S.Pt., M.Si.						
Course requirements	Dairy Livestock Production						
Week	Sub CLO (End ability of each learning stage)	Assesment		Forms and Methods of Learning [time estimate)	Learning Material (Content)		Weight of Assesment (%)
		Indicator	Technique & Criteria	Offline	Online		
1	2	3	4	5	6	7	8

1	Able to discuss the concept of evolutionary development of life, the suitability of life forms and environmental forms (CLO-1)	<p>Formative:</p> <p>-</p> <p>Summative:</p> <p>Accuracy and completeness in explaining the objectives and philosophy interaction termal animals and environment</p>	<p>Criteria Formative:</p> <p>Criteria Summative:</p> <p>Quiz (10)</p> <p>Assessment Technique:</p> <p>Test</p>	<p>Studying:</p> <p>Small group discussion, other methods</p> <p>1 x 2 x 50</p>		<p>Material coverage, lectures, independent/structured tugas, self-study, lecture rules.</p> <p>Material: CHAPTER 1 = Introduction</p> <p>Handbook: UT Livestock Environmental</p>	10
2-3	Able to discuss the concepts of zoogeography, bioclimatology and morphological, anatomical, behavioral and communication adaptations of livestock to the environment (especially hot/tropical) (CLO-1)	<p>Formative:</p> <p>-</p> <p>Summative:</p> <p>Accuracy and completeness of explanation</p>	<p>Criteria Formative:</p> <p>Criteria Summative:</p> <p>Case Study (15) assessed with rubric I011240002</p> <p>Assessment Technique:</p> <p>Test and Non-Test</p>	<p>Studying:</p> <p>Small Group Discussion, Case Study</p> <p>2 x 2 x 50"</p>		<p>Understanding and explanation of Chapter 2 zoogeography, bioclimatology and adaptability in livestock in their environment (especially tropical - hot)</p>	15

3-4	Able to analyze the adaptation of body temperature and body fluid regulation in livestock in their environment (especially hot/tropical) (CLO-1)	<p>Formative:</p> <p>-</p> <p>Summative:</p> <p>Accuracy and completeness in explaining related aspects</p>	<p>Criteria Formative:</p> <p>Criteria Summative:</p> <p>Group Paper Assignment (10)</p> <p>Assessment Technique:</p> <p>Test and Non-Test</p>	<p>Studying:</p> <p>Small Group Discussion, Case Study.</p> <p>1 x 2 x 50"</p>	<p>Definition & explanation of chapters 3 & 4 morphological, anatomical, behavioral and communication adaptations of livestock to the environment (especially hot / tropical)</p>	10
5-6	Able to apply the concept of adaptation to the reproductive system of livestock (cattle, goats, pigs, poultry) especially in tropical-hot environments (CLO-2)	<p>Formative:</p> <p>-</p> <p>Summative:</p> <p>Accuracy and completeness in explaining related askep</p>	<p>Criteria Formative:</p> <p>Criteria Summative:</p> <p>Case Study (15)</p> <p>Assessment Technique:</p> <p>None</p>	<p>Studying:</p> <p>Small group discussion, case study.</p> <p>2 x 2 x 50"</p>	<p>Accuracy and completeness in explaining the related askep</p>	15
7-10	Able to apply the concept of adaptation to dairy livestock production especially in hot/tropical environments (CLO-2)	<p>Formative:</p> <p>-</p> <p>Summative:</p> <p>Accuracy and completeness in explaining related</p>	<p>Criteria Formative:</p> <p>Criteria Summative:</p> <p>Case Study (20)</p> <p>Assessment Technique:</p> <p>None</p>	<p>Studying:</p> <p>Small Group Discussion, Case Study</p> <p>4 x 2 x 50</p>	<ol style="list-style-type: none"> 1. Definition and explanation of aspects of reproductive adaptation (behavioral, functional and structural) in mammalian livestock related to environmental factors. 2. Group discussion: recent articles that present related aspects. 	20
11-13	Able to apply the concept of adaptation to the production of	<p>Formative:</p>	<p>Criteria Formative:</p>	<p>Studying:</p>	<p>1. Definition and explanation of</p>	15

	egg- laying poultry (chicken - ducks) especially in hot/tropical environments (CLO-2)	- Summative: Accuracy and completeness in explaining related asken	Criteria Summative: Case Study (15) Assessment Technique: None	Small Group Discussion, Case Study. 3 x 2 x 50"	aspects of dairy cattle production (behavioral, functional and structural) related to environmental factors. 2. Group discussion: recent articles presenting related aspects.	
14-16	Able to apply the concept of adaptation to the production of egg- laying poultry (chicken, duck) especially in hot/tropical environments (ducks) especially in hot/tropical environments ()	Formative: - Summative: Accuracy and completeness explain	Criteria Formative: Criteria Summative: Case Study (15) Assessment Technique: Test and Non-test	Studying: Small Group Discussion, Case Study 3 x 2 x 50"	1. Definition and explanation of aspects of broiler/egg production (behavioral, functional and structural) related to environmental factors. 2. Group discussion: recent articles presenting related aspects	15

Matrix ILO, CLO, and Assessment Method

SLO / CLO	CLO-1	CLO-2
SLO-6 (KU3)		
SLO-8 (KK2)		

Evaluation Type and Assessment Weight

Type	Assessment Weight
Quiz	10
Case Study	80
Group Paper Assignment	10
Total	100

Assessment and Evaluation of Student Achievement of CLO

SLOs imposed on MK	CLO	SUB CLO	Form of Assessment*				Weight	Value	Student Score
			Formative	Summative					
				Quiz	Case Study	Group Paper Assignment			
SLO-	CLO-1	SUB-CLO-1		10	0	0	10		
SLO-	CLO-1	SUB-CLO-2		0	15	0	15		
SLO-	CLO-1	SUB-CLO-3		0	0	10	10		
SLO-	CLO-2	SUB-CLO-4		0	15	0	15		
SLO-	CLO-2	SUB-CLO-5		0	20	0	20		
SLO-	CLO-2	SUB-CLO-6		0	15	0	15		
SLO-	CLO-	SUB-CLO-7		0	15	0	15		
				10	80	10	100		



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BACHELOR PROGRAMME IN ANIMAL HUSBANDRY

STUDENT STRUCTURED ASSIGNMENT PLAN

Course	Environmental Science of Livestock				
Code	23101120303	Credit	3	Semester	3 (Three)
Developer Lecturer	Dr. Hasbi, S.Pt., M.Si				
Task Form	Task Time				
Documents/Magazines	2 Weeks				
Task Title					
Zoogeography, bioclimatology, and adaptability of livestock in their environment (especially hot tropical environments)					
Course Learning Outcomes					
Sub-CLO-2 Able to discuss the concepts of zoogeography, bioclimatology, and morphological, anatomical, behavioral, and communication adaptations of livestock to the environment (especially hot/tropical): (ILO-1)					
Task Description					
The students' assignment is a group project to write a paper on "Morphological, Anatomical, and Behavioral Adaptations of Livestock to the Environment." The paper should be written according to the following procedure: 1) Each group chooses one of the following subtopics: Morphological, Anatomical, and Behavioral Adaptations of Livestock to the Environment. 2) Discuss among the group members to identify the process stages for each of the selected sub-topics. Information related to the selected sub-topic can be obtained from textbooks and journals. 3) Create a paper with the following systematics: I. Introduction II. Discussion III. Conclusion IV. Literature 4) Group presentation					
Assignment Method					
1. Conducted in groups using the Small Group Discussion (SGD) learning method.					
Form and Format of Output					
a. Object of Cultivation: Morphological, Anatomical b. Form of Output: Paper					
Indicators, Criteria and Assessment Weight					
Indicators: 1. Systematics: 10% 2. Accuracy of analysis: 25% 3. Depth of material: 30% 4. Novelty and reputation of library materials: 10% 5. Team cohesiveness: 10% 6. Mastery of the material: 15%					
Implementation Schedule					
2 weeks					

Other
-
Reference List
<ol style="list-style-type: none"> 1. Rahardja, D.P., dan Veronica SriLestari., 2017. Lingkungan Ternak. Modul Pembelajaran, Universitas Terbuka. 2. Lembaga Ilmu Pengetahuan Indonesia, 2014. Kekinian KEanekaragaman Hayati Indonesia. 3. Endah Murniningtyas. Wahjyuningsih Darajati. Efendi S., Sumendi. 2016. Indonesian Biodiversity – Strategy and Action Plan 2015 – 2010. Kementerian Perencanaan Pembangunan Nasional – BAPPENAS. 4. Hall, S.J.G. 2004. Livestock Biodiversity – Genetic Reseources for the Farming of the Future. Blackwell Science, Ltd., India. 5. Storey KB., and Storey JM. 2005. Biochemical Adaptation to Extreme Environments, In: Integrative physiology in the proteomics and post-genomics age, ed. By Walz W., Humana Press Inc.,Totowa, New Jersey 07512. 6. Bess Tiesnamurti dkk. 2011. Rencana Aksi Global Sumber Daya Genetik Ternak dan Deklarasi Interlaken. Pusat Penelitian dan Pengembangan Peternakan. Pusat Penelitian dan Pengembangan Peternakan, Bogor. 7. Faye, B. 2013. Anatomical and physiological adaptation of domestic animals to ecosystem constraints: the example of the camel in arid lands. 8. Collier, R.J., and J.L. Collier (Editor).2012. Environmental Physiology of Livestock. Wiley-Blackwell.UK. 9. Sejian, V., et.al., 2012. Environmental Stress and Amelioration in Livestock Production. Springer, London. 10.Reece, WO., et al. (ed). 2015. Dukes' Physiology of Domestic Animals, USA., UK. 11.Barrett, KE., et al. 2010. Ganong's Review of Medical Physiology, UK

DEFINITION OF 1 CREDIT IN THE FORM OF LEARNING				Time
A	Lecture, Reception, Tutorial			
	Face to Face	Structured Assignment	Independent Learning	
	50 minutes/week/semester	60 minutes/week/semester	60 minutes/week/semester	2,83
B	Seminars or other similar forms of learning			
	Face to face	Self-study		
	100 minutes/week/semester	70 minutes/week/semester		2,83
C	Practicum, studio practice, workshop practice, field practice, research, community service, and/or other equivalent forms of learning			
	170 minutes/week/semester			2,83

No	Metode Pembelajaran Mahasiswa	Kode
1	Small Group Discussion	SGD
2	Role-Play & Simulation	RPS
3	Discovery Learning	DL
4	Self-Directed Learning	SDL
5	Cooperative Learning	CoL
6	Collaborative Learning	CbL
7	Contextual Learning	CtL
8	Project Based Learning	PJBL
9	Problem Based Learning & Inquiry	PBL

No	Metode Pembelajaran Mahasiswa	Kode
10	Atau metode pembelajaran lain, yang dapat secara efektif memfasilitasi pemenuhan capaian pembelajaran lulusan.	