Course Syllabus

1	**Course title**	Environmental Physiology of Farm Animals	
2	**Course number**	0632459	
3	**Credit hours**	3	3
	Contact hours (theory, practical)	(3,0)	
4	**Prerequisites/corequisites**	Principles of Animal Production. (0602101)	
5	**Program title**	B.Sc. Animal Production	
6	**Program code**		
7	**Awarding institution**	University of Jordan	
8	**School**	**Agriculture**	
9	**Department**	**Animal Production**	
10	**Course level**	**Fourth year**	
11	**Year of study and semester (s)**	**Second semester 2021/2022**	
12	**Other department (s) involved in teaching the course**		
13	**Main teaching language**	**None**	
14	**Delivery method**	X Face to face learning ☐Blended ☐Fully online	
15	**Online platforms(s)**	X Moodle ☐Microsoft Teams ☐Skype ☐Zoom ☐Others……	
16	**Issuing/Revision Date**	1/3/2022	

17 Course Coordinator:

Name: Dr. Mohannad Abuajamieh	Contact hours: Any time
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18 Other instructors:

Name: Office number: Phone number: Email: Contact hours: Name: Office number: Phone number: Email: Contact hours:

19 Course Description:

Understanding farm animals (Cattle, Sheep, Goat and Poultry) environmental needs and biological responses to the environments is essential for providing good animal care and maintaining optimum performance. The course will review aspects of effects of environmental factors on physiological processes in farm animals. General responses to heat stress, thermo-neutral zone, heat and cold stress, thermoregulation, behavioral responses, homeostasis, welfare and role of genotype. Acclimatization and adaptation, health, economic losses and measurements of heat stress effects. Effect of heat stress on performance and strategies to reduce it will be covered.

20 Course aims and outcomes:

A- Aims:

1. To acquire principles of thermal biology of farm animals to the environment with special focus on heat stress.
2. To develop a basic understanding of animal physiological responses to the environment and how these responses influence health, performance and well-being.
3. To develop the ability to relate principles of thermal biology to problems of farm animal management caused by adverse environments.
4. To develop an advanced understanding of the environmental needs of farm animals.
5. To develop science-based recommendations for farm animals management in hot climates.
6. Provide the basic physiological information needed to understand the nature of environmental physiology
7. Empower students to learn and apply principles of environmental physiology
8. Discussing the environmental effects on gene expression
9. Discussing the effects of environment on metabolism, nutrient requirement, production, reproduction, health, welfare, and immunity
10. Equip the students in advising the farmers to mitigate the negative influence of the climatic variables on the farm animals productivity

B- Students Learning Outcomes (SLOs):

Upon successful completion of this course, students will be able to:

Program ILOs* / **Course SLOs**	ILO (1)	ILO (2)	ILO (3)	ILO (4)	ILO (5)	ILO (6)	ILO (7)	ILO (8)
(1) Ability to define and explain the terms related to environmental and stress physiology	X					X		
(2) Know the signs, symptoms, and effects caused by environmental stress	X					X		
(3) Understanding stress physiology and its effects on different body systems	X					X		
(4) Ability to estimate the economic effects of environmental stress	X					X		
(5) Understands the mechanisms of temperature regulation	X					X		
(6) Discuss the different management strategies used to ameliorate the negative consequences of environmental stressors				X		X		

At the successful completion of the Bachelor Program in Animal Production the student should be able:

ILO1. Demonstrate a deep understanding of the basic principles in the various areas of livestock production; including nutrition, physiology, genetics, health and management.

ILO 2. Apply the acquired knowledge in various areas of livestock production.

ILO 3. Utilize critical thinking and logical reasoning in addressing issues related to livestock production.

ILO 4. Communicate effectively with a wide range of related stakeholders and provide appropriate extension services.

ILO 5. Apply the principles of public safety and environmental protection.

ILO 6. Acquire and apply practical skills along with keeping up with recent advances in livestock production.

ILO 7. Identify basic principles of research methodology and evidence-based decision making.

ILO8. Abide by professional, ethical and legal considerations relevant to the livestock production.

21. Topic Outline and Schedule:

Week	Lecture	Topic	Intended Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Introduction	1	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
	1.2	Introduction						
	1.3	Terminology-Glossary of term for environmental physiology						

2	2.1	Physical properties of heat and temperature	1	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
	2.2	Homeostasis						
	2.3	Homeostasis						
3	3.1	Environmental physical factors	1, 2	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
	3.2	Optimal animal environment						
	3.3	Optimal animal environment						
4	4.1	Animal welfare	2	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
	4.2	Thermo-neutral zone						
	4.3	Thermo-neutral zone						
5	5.1	Animals Environment	3	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
	5.2	Heat stress						
	5.3	Heat stress						
6	6.1	General responses of animals to heat stress	2, 5	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
	6.2	General responses of animals to heat stress						
	6.3	General responses of animals to heat stress						

7	7.1 7.2 7.3	Heat loss Heat gain Body heat production	5	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
8	8.1 8.2 8.3	Heat balance Insulation Behavior	5	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
9	9.1 9.2 9.3	Effects of heat stress on certain physiological parameters	3	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
10	10.1 10.2 10.3	Effects of heat stress on certain physiological parameters	2, 3	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
11	11.1	Pathophysiology and morphological effects of heat stress	3	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
	11.2	Pathophysiology and morphological effects of heat stress					Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
	11.3	Pathophysiology and morphological effects of heat stress					Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
12	12.1	Nutrient metabolism and	3	Face to Face	Moodle	**Synchronous**	Assignments, quizzes,	Ref. 1, 2, 3, and 4

		partitioning in heat stress					and reports	
	12.2	Nutrient metabolism and partitioning in heat stress						
	12.3	Nutrient metabolism and partitioning in heat stress						
13	13.1 13.2 13.3	Environment and animal health	3	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
14	14.1 14.2 14.3	Economic losses due to heat stress	4	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4
15	15.1 15.2 15.3	How to ameliorate the negative effects of stress	6	Face to Face	Moodle	**Synchronous**	Assignments, quizzes, and reports	Ref. 1, 2, 3, and 4

22 Evaluation Methods:

Opportunities to demonstrate achievement of the SLOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	SLOs	Period (Week)	Platform
Assignments, quizzes, and lab reports	20%	Throughout the semester, with deferent topics of the course	See the students learning outcomes (SLOs) table	Throughout the semester	Face to Face, and Moodle
Midterm Exam	30%	TBD		17/4/2022 (Sun)	Face to Face
Final Exam	50%	All covered topics		11/6/2022-23/6/2022	Face to Face

23 Course Requirements

(e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):

24 Course Policies:

A- Attendance policies:

Each student is expected to take their own notes (part from the exam) and to attend class. Absence from lectures shall not exceed 15%. Students are expected to attend all lectures but if a student is absent from class, it is their responsibility to get the material that was missed. You must get any handouts or notes from your classmates.

B- Absences from exams and submitting assignments on time:

Exams will consist of **multiple choices, true/false, matching, fill-in-the-blank**, **critical thinking questions.** Exams will cover all material presented for each section. Make-up exams will only be provided for students with an excused absence AND supporting documentation. The questions and/or format of any make-up exam may differ from that of the original exam. Scheduling of a make-up exam will vary depending upon available dates/times but **MUST** occur before the next-scheduled exam date.

C- Health and safety procedures:

Students should follow the Jordanian government guide.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

Academic dishonesty will NOT be tolerated. This includes cheating, fabrication or falsification, plagiarism, abuse of academic materials, complicity in academic dishonesty, falsifying grade reports, and misrepresentation to avoid academic work. For this course, evidence of any form of academic dishonesty will result in all involved students receiving zero points for any associated exam, or assignment

E- Grading policy:

Assignments, quizzes, and lab reports	20%
Mid-exam	30%
Final Exam	50%
Total Points	100%

F- Available university services that support achievement in the course:

Students account on E-learning, and Microsoft teams

25 References:

A- Required book(s), assigned reading and audio-visuals:

1. Leon, L. R. 2015. Pathophysiology of Heat Stroke. Morgan & Claypool Publishers. USA
2. **Sejian**, V., J. **Gaughan**, L. **Baumgard**, and C. **Prasad**. 2015. Climate Change Impact on Livestock: Adaptation and Mitigation. Springer India. IndiaCollier, R. J., and J. L.
3. Collier. 2012. Environmental Physiology of Livestock. Wiley-Blackwell. USA**Sejian**, V., S. M. K. **Naqvi**, T. **Ezeji**, J. **Lakritz**, and R. **Lal**. 2012. Environmental Stress and Amelioration in Livestock Production. Springer-Verlag Berlin Heidelberg.
4. Scientific articles

B- Recommended books, materials, and media:

- Given scientific papers, announced seminars and presentations
- Videos given at e-learning or Microsoft Teams

26 Additional information:

Name of Course Coordinator: Dr. Mohannad Abuajamieh Signature: ---------- Date: 1/3/2022
Head of Curriculum Committee/Department: ---------- Signature: ----------
Head of Department: ---------- Signature: ----------
Head of Curriculum Committee/Faculty: ---------- Signature: ----------
Dean: ---------- Signature: ----------