**The University of Jordan**

**Faculty of AgricultureDepartment of Animal Production**

**Program: M.Sc.2015-2016/Second semester**

**Course title: Environment and the Production of Farm Animals (632713)**

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| **Credit hours** | 3 | **Level** | Graduate/Master program | **Pre-requisite** |  |
| **Coordinator/ Lecturer** | Prof. Abdur-Rahman Al-Fataftah | **Office number** | 115 | **Office phone** | 22380 |
| **Course website** | On UJ E. Learning portal @ Moodle LCM. | **E-mail** | a.fataftah@ju.edu.jo | **Place** | Animal Production Meeting Room |

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| --- | --- | --- | --- | --- | --- |
| **Office hours** | | | | | |
| **Day/Time** | **Sunday** | **Monday** | **Tuesday** | **Wednesday** | **Thursday** |
| **Day** | **\*** | **\*** | **\*** | **\*** | **\*** |
| **Time** | **10:00 - 11:00**  **03:00 - 04:00** | **10:00 - 11:00**  **01:00 - 03:00** | **10:00 - 11:00**  **03:00 - 04:00** | **10:00 - 11:00**  **01:00 - 03:00** | **01:00 - 02:00**  **03:00 - 04:00** |

**Course Description**

The goals of this course are to provide the students with an enough knowledge to define, understand, and manage the climatic change mainly heat stress, and to increase the scientific and practical skills of the students in order to successfully conduct research related to heat stress and its management and to write scientificin a professional way as well.

**Learning Objectives**

1. To let the students gain the required knowledge needed to better define and understand the climate change specially heat stress.
2. To familiarize the students with the effects of heat stress on blood bioenergetics, inflammatory biomarkers, and gut integrity.
3. Develop the students’ ability to review the literature, write in a scientific way, and orally present their work.

**Intended Learning Outcomes (ILOs):**

Successful completion of the course should lead to the following outcomes:

1. **Knowledge and Understanding:** Student is expected to

A.1- Understanding the environmental factors that affect farm animals’ health, welfare, behavior and performance.

A.2- Understanding the physiological, behavioral, and morphological, responses of farm animals to cope with changes in the environment.

A.3- Knowledge of types of stress with emphasis on heat stress and its effects on farm animals’ productivity, health, well-being, and quality of products.

A.4- Be aware of the various methods and strategies to alleviate effects of heat stress.

A.5- Familiarize the students with the immune system responses under environmental stressors.

A.6- Understand the interaction between the immune system, the central nervous system, and the endocrine system.

**B. Intellectual, Analytical and Cognitive Skills:** Student is expected to

B.1- The students should be able to identify and describe the environmental factors affecting farm animals’ performance and products quality.

B.2- Be able to take necessary measures to avoid environmental stressors, and find solutions to reduce their effects in case it occurs.

B.3- Be able to manage farm animals under various environmental conditions.

B.4- Be able to analyze environmental data and its magnitude impacts and to provide the optimum environment needs for various classes and types of farm animals, namely cattle, sheep, goats, and poultry to achieve maximum production and profits.

**C. Subject- Specific Skills:**

C.1- The students will have sufficient skills, knowledge, techniques and methods to increase productivity and profitability of farm animals in hot climates.

C.2- Be able to design and implement professionally scientific research in the field of applied animal-environment interaction.

C.3- The students will be qualified to give recommendations and consultancy to farmers and others concerned on the impacts of environment on farm animals’ performance and how to manage it.

C.4- The students’ presentation skills, scientific discussion and communication will be developed as well as their writing through reports and proposals.

C.5- Will be able to explain the changes of the immune system under stress and its interaction with the other systems.

**D. Transferable Key Skills:** Student is expected to

D.1- The students should have enough skills to decrease the direct and indirect economic losses due to environmental stressors specially heat stress.

D.2- Be able to efficiently manage farm animals organic and non-organic farms in hot climates.

D.3- The students will have the necessary knowledge and skills to establish and prepare farm animals in different climates mainly in hot regions.

D.4- Equipped with sufficient knowledge about the global warming effects on animal production, and the role of farm animals during this phenomena.

**ILOs: Learning and Evaluation Methods**

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| **ILO/s** | **Learning Methods** | **Evaluation Methods** |
| **A**. Knowledge and Understanding (**A1-A5**) | Presentations and scientific paper discussions | Exams, discussion, term-papers, and presentations |
| **B**. Intellectual Analytical and Cognitive Skills (**B1-B3**) | Presentations and scientific paper discussions | Exams, discussion, term-papers, and presentations |
| **C**. Subject Specific Skills (**C1-C4**) | Presentations and scientific paper discussions | Exams, discussion, term-papers, and presentations |
| **D**.Transferable Key Skills (**D1-D7**) | Presentations and scientific paper discussions | Exams, discussion, term-papers, and presentations |

**Course Contents**

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| --- | --- | --- | --- |
| **No. of lecture (s) /Week** | **Subject** | **Sources** | **ILOs** |
| **3**  (1stweek) | **Introduction**   * Climate change * Heat stress * Weather conditions in Jordan | * Recently published papers * Power point lectures. | **A-1, A-3, B-1, D-4** |
| **6**  (2ndand 3rdweek) | **Farm animal responses, behavior and thermoreulation** | * Recently published papers | **A-2** |
| **3**  (4th week) | **Effects of heat stress on livestock productivity.**   * Milk * Meat * Eggs | * Recently published papers | **B-4, C-1** |
| **3**  (5th week) | **Effects of heat stress on livestock reproduction** | * Recently published papers | **C-1** |
| **3**  (6th week) | **Pathophysiology of heat stress.**   * Blood bioenergetics * Inflammatory biomarkers * Hormonal changes | * Recently published papers | **A-2** |
| **3**  (7th week) | **Morphological changes in the GIT under heat stress conditions.**   * Tight junctions * Measurements of intestinal permeability * Endotoxin (LPS) | * Recently published papers | **A-2** |
| **3**  (8thweek) | **Immunological responses to heat stress.** | * Recently published papers | **A-5, C-5** |
| **3**  (9th week) | **First Hour Exam** |  |  |
| **3**  (10thweek) | **Neuroendocrine responses to stress** | * Recently published papers | **A-6** |
| **3**  (11st week) | **Nutrient metabolism and partitioning in heat stress**   * Carbohydrates * Proteins * Fats | * Recently published papers | **D-1** |
| **12**  (12nd, 13th, 14th and 15th week) | **Management of heat stress**   * **Building design** * **Genetics** * **Nutritional modification and feed additives.** | * Recently published papers | **A-4, B-2, B-3, C-1, C-2, C-3, C-4, D-1, D-3** |
| **1**  (16th week) | **Final Exam** |  |  |

**Learning Methodology**

The course will be structured in power point lectures, discussions, theoretical and practical exercises. The course comprises overviews, from general understanding to expert knowledge on key topics, and learning is based on lectures as well as independent learning through exercises, excursions, and a final project work.

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| **Evaluation** | **Point %** | **Date** |
| First Exam | 15% | **Tuesday: 29/3/2016** |
| Second Exam | 15% | **Tuesday: 26/4/2016** |
| Oral presentations, participation, reports | 30% |  |
| Final exam | 40% | **Will be announced later.** |

**References:**

# **Sejian**, V., J. **Gaughan**, L. **Baumgard**, and C. **Prasad**. 2015. Climate Change Impact on Livestock: Adaptation and Mitigation. Springer India. India

# Collier, R. J., and J. L. 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.Germany

* Recently published papers
* Poultry and livestock internet websites

**Intended Grading Scale**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **From (%)** | **To (%)** | **Scale** | **Mark** | **Result** |
| 0 | 46 | 0 | H (F) | Fail |
| 47 | 49 | 0.75 | D- | Fail |
| 50 | 53 | 1 | D | Fail |
| 54 | 56 | 1.5 | D+ | Fail |
| 57 | 59 | 1.75 | C- | Fail |
| 60 | 63 | 2 | C | Fail |
| 64 | 66 | 2.5 | C+ | Accepted |
| 67 | 69 | 2.75 | B- | Good |
| 70 | 73 | 3 | B | Good |
| 74 | 76 | 3.5 | B+ | Very Good |
| 77 | 79 | 3.75 | A- | Excellent |
| 80 | 100 | 4 | A | Excellent |

**Notes:**

* Concerns or complaints should be expressed in the first instance to the module lecturer; if no resolution is forthcoming, then the issue should be brought to the attention of the module coordinator (for multiple sections) who will take the concerns to the module representative meeting. Thereafter, problems are dealt with by the Department Chair and if still unresolved the Dean and then ultimately the Vice President.For final complaints, there will be a committee to review grading the final exam.
* For more details on University regulations please visit:

<http://www.ju.edu.jo/rules/index.htm>