COURSE OUTLINE

1. GENERAL

SCHOOL	Animal Biosciences		
ACADEMIC UNIT	Animal Science		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**18**	**SEMESTER**	**9ο**
COURSE TITLE	ANIMAL SCIENCE AND ENVIRONMENT		

INDEPENDENT TEACHING ACTIVITIES *if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits*	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	4	4
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	special background, specialised general knowledge
PREREQUISITE COURSES:	---
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/courses/292/
Academic Staff	Laliotis G., Pappas A., Kalogirou S., Hajigeorgiou I.

2. LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

- *Understanding the parameters that determine the environmental footprint of animal husbandry.*
- *Understanding the effects of climate on terrestrial animals' and aquatic organisms' health, reproduction, and productivity.*
- *Analysis of the factors that affect quantitatively and qualitatively the greenhouse gas emissions produced by animal farming.*
- *Analysis of methods for adaptation of livestock production towards climate change.*
- *Analysis of strategies for mitigating the environmental footprint of animal husbandry.*
- *Understanding the parameters that affect livestock waste production and its management.*
- *Impact of animal husbandry on biodiversity.*
- *Understanding the relationship between climate change and aquatic ecosystems and aquaculture.*

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism

Working in an international environment *Working in an interdisciplinary environment* *Production of new research ideas*	*Production of free, creative and inductive thinking* *……* *Others…* *…….*
Respect for the natural environment Adapting to new situations Decision-making Search for analysis and synthesis of data and information, with the use of the necessary technology Project planning and management Production of free, creative, and inductive thinking	

3. SYLLABUS

- Factors affecting the environmental footprint of animal husbandry.
- Direct and indirect effects of climate on animal production
- Effects of climate and extreme weather conditions on animal production and specifically on the growth, reproduction, milk production, meat production and egg production of farm animals.
- Measures to cope with and adapt productive animals to climate change.
- Greenhouse gas emissions from farm animals and the various production systems.
- Factors affecting the carbon footprint of animal products produced.
- Methodologies for estimating gases emitted by livestock and strategies to reduce them.
- Livestock waste and ways to manage it to reduce its environmental footprint.
- Animal husbandry and biodiversity.
- Impact of climate change on aquaculture and aquatic ecosystems and aquaculture.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face to face and distance learning
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	-Lecture in a ppt format file uploaded in the e-class web page --Synchronous remote lecture delivery
TEACHING METHODS *The manner and methods of teaching are described in detail.* *Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.* *The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other* *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	-Evaluation is conducted in Greek -Assessment by examination, with open ended questions and/or multiple choice

Activity	***Semester workload***
Lectures	40
Independent study	60
Course total	***100 hours***

5. ATTACHED BIBLIOGRAPHY

(A) Suggested bibliography:

1. Ruminant Nutrition , 2013 (Ch. 9 Animal Husbandry and climate change).

2. Animal Science Review, Special Edition 35, 2009

3. Rojas-Downing, Pouyan Nejadhashemi, Harrigan, Woznicki, (2017). Climate change and livestock: Impacts, adaptation, and mitigation, Climate Risk Management, 16,145-163

4. Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci, A. &Tempio, G. (2013) Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome.

5*. FAO (2006), Livestock's long shadow: Environmental issues and options, Food and Agriculture Organization, Rome Italy*

6. IPCC. (2006) IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4 - Agriculture, Forestry and Other Land Use. Chapter 10 - Emissions from Livestock and Manure Management. Intergovernmental Panel on Climate Change.

7. De Vries, M., De Boer, I.J.M. (2010). Comparing environmental impacts for livestock products: A review of life cycle assessments. Livestock Science, 128(1-3), p. 1-11.

(*B) Digital Educational Materials (e-class; in Greek):*

G. Laliotis (2021). Livestock Production, Environment, climate change and production systems. Lectures in electronic format

G. Laliotis (2022). Methodologies for Greenhouse gas estimation. Lectures in electronic format.

G. Laliotis (2023). Introduction to livestock waste. Lectures in electronic format.

A. Pappas (2022). Bird nutrition and environment. Lectures in electronic format

I. Hatjigeorgiou (2022). Animal husbandry, grazing and the environment. Lectures in electronic format

S. Kalogirou (2023). Climate change and the effects on aquatic ecosystems and aquaculture. Lectures in electronic format

S. Kalogirou (2023). Fishery Production and Management. Lectures in electronic format.

S. Kalogirou (2023) Aquacultures, their effects on coastal waters and their environmental licensing framework. Lectures in electronic format