COURSE OUTLINE

(1) GENERAL

SCHOOL	ANIMAL BIOSCIENCES		
ACADEMIC UNIT	DEPARTMENT OF ANIMAL SCIENCE		
LEVEL OF STUDIES	Undergraduate [Free Elective]		
COURSE CODE	503	**SEMESTER**	6th
COURSE TITLE	CLIMATOLOGY		

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 (ECTS)**
Lectures	3	2
Total	**3**	**2**
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*	Scientific area
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS:	YES (IN ENGLISH)
COURSE WEBSITE (URL):	

(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*

The subject of the course is familiarization with topics related to climate conditions which prevail in macro- mesoand micro-scale regions. The climate variability, climate change, the El Niño and La Niña phases of Southern Oscillation as well as the North Atlantic Oscillation (NAO) which affect the climatic conditions of many regions contributing to changes in terrestrial and aquatic ecosystems, are analyzed. Emphasis is placed on the study of the microclimatic conditions of outdoor and indoor areas for livestock farms, as well as areas for storing of agricultural products.
The aim of the course is the understanding of climatology topics so that the graduated agronomists of the department have the knowledge to prepare a microclimatic study related to the planning of the construction and expansion of livestock businesses and the evaluation of agricultural areas for the cultivation of livestock plants.
Upon successful completion of the course, the student will be able to:
• understand the methods of climate data analysis as well as the new techniques related to the operation of networks receiving climate data from automatic climate stations.
• use methodologies of climate data analysis in order to prepare plans and projects related to the establishment of livestock farms and the management of agricultural lands for the cultivation of livestock plant species.
• to collaborate with other students to create a microclimatic plan - a framework which in the future, will be part of a project for

the installation of livestock farms.

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	*Project planning and management*
Adapting to new situations	*Respect for difference and multiculturalism*
Decision-making	*Respect for the natural environment*
Working independently	*Showing social, professional and ethical responsibility and sensitivity to gender issues*
Team work	*Criticism and self-criticism*
Working in an international environment	*Production of free, creative and inductive thinking*
Working in an interdisciplinary environment	.....
Production of new research ideas	*Others...*
	.....

- Decision Making
- Autonomous Work
- Group Work
- Capability For Critisism And Self-Criticism
- Development Of Free, Constructive And Inductive Thinking

(3) SYLLABUS

The weekly topics of the course are as follows:

- Introduction, history and topics of climatology. Climate stations, units for automatic stations, monitoring, transmission and processing of climate parameters.
- Analysis of basic climate parameters and study of their spatiotemporal distribution. Thermal environment and animals.
- Heat exchange between animals and environment. Utilization of climatic parameters for the evaluation of areas for the establishment of livestock farms and crops.
- Classification and description of the earth's climates. Climate classifications of Köppen and Thorthnwaite.
- Papadakis bioclimatic classification, bioclimatic indices, bioclimatic classification of Unesco-Fao and Gaussen index.
- Thermal stress indexes for animals. Evaluation of areas for livestock exploitation according to complex terrain and topography.
- Earth climate zones and their vegetation.
- Climate of Greece
- Micro-, meso, and micro- climates. Topoclimate. Microclimate conditions inside animal shelters. Microclimates of agricultural products warehouses.
- Climate and vegetation, phytoclimate, microclimate of meadows and pastures. Microclimate of tree orchards and forests.
- Climate variability. Global warming and global climate change and their effects on terrestrial and aquatic ecosystems.
- North Atlantic Oscillation (NAO), the El Niño and La Niña phases of the Southern Oscillation and their effects on the animals and the aquatic environment.
- Climatic parameters and dispersion of pollutants, effects on terrestrial and aquatic ecosystems. Rehabilitation of polluted areas - decontamination.

(4) TEACHING and LEARNING METHODS - EVALUATION

TEACHING METHOD *Face-to-face, Distance learning, etc.*	In-class lecturing and observations in fields.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	Use ofslides using powerpoint and slide show. Communication with students via e-mail and databases. Use of national and international databases of the university library and other educational and research institutions. Learning process support by access to e-class asynchronous distance learning platform.
TEACHING METHODS *The manner and methods of teaching are described in detail.*	

Activity	***Semester workload***
Lectures	26

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*	Educational visits: 4 Study and analysis of bibliography: 3 Interactive teaching: 2 Projects: 15 **Course total (25 h of workload per ECTS)**: ***50***
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.*	I. Written examination including: 1. Short answer questions 2. open-ended questions 3. problem solving 4. Written Work II. Oral examination (where necessary)

(5) ATTACHED BIBLIOGRAPHY

In Greek language

• Chronopoulou-Sereli A., Flocas A. 2010. Lessons of Agricultural Meteorology and Climatology.
• Ziti Publications, Thessaloniki, Greece. (Eudoxus code: 11437).
• Chronopoulou-Sereli A., Tsiros I., Kamoutsis A., Matsoukis A., Droulia F., Charalampopoulos I. and Chronopoulos C. 2012. General and Special Topics in Bioclimatology. Applications – Exercises. Ziti Publications, Thessaloniki, Greece. (Eudoxus code: 32997875).
• Kanellopoulou E., 2007. Applied Climatology, S. Athanasopoulos Publications, Αθήνα, (Eudoxus code: 45439).
• Chronopoulou-Sereli A., Chronopoulos I.K. 2011. Biometeorology-Bioclimatology. Applications • to the configuration of outdoor spaces. Ziti Publications, Thessaloniki, Greece. (Eudoxus code: 12583580).The Journal of Agricultural Education & Extension http://www.tandfonline.com/toc/raee20/current

In English language

• Gomez da Silva, R., Campos Maia, A.S., 2013. Principles of Animal Biometeorology, Springer Science + Business Media B.V., Dordrecht, Netherlands.
• Ebi Kristie L., 2009. Biometeorology for adaptation to climate variability and change. Springer Science + Business Media B.V., Dordrecht, Netherlands.
• Geiger R., Aron R.H. and Todhunder P., 2003. The climate near the ground. Rowman and Littlefield Publishers, Lanham, MD, USA.
• Mavi, H. S., 2004. Agrometeorology. Principles and applications of climate studies in agriculture. Haworth Press Inc. NY, USA.
• Seemann J., Chirkov Y. I., Lomas, J. and Primault B. 1979. Agrometeorology. Springer-Verlag Berlin Heidelberg.