

COURSE OUTLINE

1. GENERAL INFORMATION

FACULTY/SCHOOL	SCHOOL OF ANIMAL BIOSCIENCES		
DEPARTMENT	DEPARTMENT OF ANIMAL SCIENCE		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	503	Semester:	4 th
COURSE TITLE	CLIMATOLOGY		
INDEPENDENT TEACHING ACTIVITIES <i>in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits</i>		WEEKLY TEACHING HOURS	ECTS
		2	2
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4</i>		-	-
COURSE TYPE <i>Background knowledge, Scientific expertise, General Knowledge, Skills Development</i>	Scientific expertise		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION:			
LANGUAGE OF EXAMINATION/ASSESSMENT:	Greek		
THE COURSE IS 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 (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:

APPENDIX A

- Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.
- Descriptive indicators 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- meso- and 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 students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

*Search for, analysis and synthesis of data and information by the use of appropriate technologies,
Adapting to new situations
Decision-making
Individual/Independent work
Group/Team work
Working in an international environment
Working in an interdisciplinary environment
Introduction of innovative research*

*Project planning and management
Respect for diversity and multiculturalism
Environmental awareness
Social, professional and ethical responsibility and sensitivity to gender issues
Critical thinking
Development of free, creative and inductive thinking
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(Other.....citizenship, spiritual freedom, social awareness, altruism etc.)
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3. COURSE CONTENT

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 Gausсен 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 METHODS--ASSESSMENT

MODES OF DELIVERY <i>Face-to-face, in-class lecturing, distance teaching and distance learning etc.</i>	In-class lecturing and observations in fields.																		
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY <i>Use of ICT in teaching, Laboratory Education, Communication with students</i>	Use of slides 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.																		
COURSE DESIGN <i>Description of teaching techniques, practices and methods: Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc.</i> <i>The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.</i>	<table border="1"> <thead> <tr> <th>Activity/ Method</th><th>Semester workload</th></tr> </thead> <tbody> <tr> <td>Lectures</td><td>26 hours</td></tr> <tr> <td>laboratory practice</td><td></td></tr> <tr> <td>Educational visits</td><td>4</td></tr> <tr> <td>study and analysis of bibliography</td><td>3</td></tr> <tr> <td>Interactive teaching</td><td>2</td></tr> <tr> <td>Projects</td><td>15</td></tr> <tr> <td></td><td></td></tr> <tr> <td>Total</td><td>50</td></tr> </tbody> </table>	Activity/ Method	Semester workload	Lectures	26 hours	laboratory practice		Educational visits	4	study and analysis of bibliography	3	Interactive teaching	2	Projects	15			Total	50
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STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS <i>Detailed description of the evaluation procedures:</i> <i>Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work.</i> <i>Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.</i>	Written examination including: I. Short answer questions 1. open-ended questions 3. problem solving 4. Written Work II. Oral examination (where necessary)
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5. SUGGESTED BIBLIOGRAPHY:

<i>In Greek language</i> <ul style="list-style-type: none"> • 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).
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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.

6. TEACHERS:

THEORY:

Athanasios Kamoutsis, Assistant Professor