COURSE OUTLINE

1. GENERAL INFORMATION

FACULTY/SCHOOL	SCHOOL OF PLANT SCIENCES		
DEPARTMENT	DEPARTMENT OF CROP SCIENCE (SPECIALIZATION OF AGRONOMY AND PLANT BREEDING.		
LEVEL OF STUDY	UNDERGRADUATE (ELECTIVE)		
COURSE UNIT CODE	266	**Semester:**	9th
COURSE TITLE	SPECIAL TOPICS ON MICROCLIMATIOLOGY AND BIOCLIMATOLOGY		
INDEPENDENT TEACHING ACTIVITIES *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*		**WEEKLY TEACHNG HOURS**	**ECTS**
Lectures		3	3
Laboratory Practice		2	2
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4		-	-
COURSE TYPE *Background knowledge, Scientific expertise, General Knowledge, Skills Development*	*Scientific expertise*		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION:	Greek		
LANGUAGE OF EXAMINATION/ASSESSMENT:			
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 object of the course is is familiarization with topics on microclimatic conditions of vegetated areas, with an emphasis on areas where field crops are cultivated. The methodology of distribution and assessment of microclimatic parameters in agricultural regions is analyzed. Emphasis is also placed on the bioclimatic conditions that occur in the rural environment. Finally, the thermal sensation conditions of animals in their rearing areas and in fields are analyzed. In the laboratory exercises, which are carried out both in the room and in the field, the aim is to become familiar with the methodology for estimating microclimatic parameters in agricultural areas and livestock facilities.

Upon successful completion of the course, the student will be able to:

- understand the methods of estimating microclimatic-bioclimatic parameters in order to apply the cultivation techniques at the appropriate time.
- collaborate with other students to create microclimatic-bioclimatic projects which in the future, will be part of a plan for the improvement of agricultural production.

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
……
(Other…….citizenship, spiritual freedom, social awareness, altruism etc.)
…….

3. COURSE CONTENT

The weekly topics of the course are as follows:

- Purpose, history and topics of microclimatology and bioclimatology. Systems for automatic monitoring, transmission, reception and processing of microclimatic parameters.
- Microclimatic conditions of vegetated areas.
- The role of relief in shaping microclimatic conditions in agricultural and non-agricultural areas.
- Microclimate, topoclimate. Phytoclimate.
- Methodology for estimating microclimatic parameters in field crops areas.
- The role of microclimatic conditions in the phenological behavior of field crops.
- Methodology for forecasting phenophases of field crops. Phenological modeling.
- Microclimatic evaluation of agricultural areas for new crops.
- Bioclimatic conditions in agricultural areas and in livestock farms. Thermal stress of animals.
- Estimation of the thermohygrometric index (THI) of people working in agricultural facilities and their evaluation.
- Representative bioclimatic indexes (PET, PMV, RSI, Humidex etc.) and their evaluation in the rural environment.
- Thermohygrometric index and thermal sensation of animals in their outdoor and indoor stables.
- Development of characteristic indexes of animal thermal sensation (BGHI, ETI, etc.) in outdoor and indoor stables.

4. TEACHING METHODS--ASSESSMENT

MODES OF DELIVERY *Face-to-face, in-class lecturing, distance teaching and distance learning etc.*	in lecturring, microclimate and bioclimate observations in fields and data analysis on laboratory.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in teaching, Laboratory Education, Communication with students*	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

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.

The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.

Activity/ Method	Semester workload
Lectures	39 hours
laboratory practice	36 hours
Individual laboratory project (results of laboratory exercises and final examination)	10
Educational visits	2
study and analysis of bibliography	6
Personal study	7
Total	100

STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS Detailed description of the evaluation procedures: 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. Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.	Written examination including: 1. Short answer questions 2. *open-ended questions* 3. *problem solving* 4. Written Work II. Oral examination (where necessary)

5. SUGGESTED BIBLIOGRAPHY:

In Greek language

- 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).
- Chronopoulou-Sereli A., Chronopoulos I.K. 2011. Biometeorology-Bioclimatology. Applications to the configuration of outdoor spaces. Ziti Publications, Thessaloniki, Greece. (Eudoxus code: 12583580).

In Enlish language

- Geiger R., Aron R.H. and Todhunder P., 2003. The climate near the ground. Rowman and Littlefield Publishers, Lanham, MD, USA.
- Mavi H.S., Tupper, G.J., 2004. Agrometeorology. Principles and Applications of Climate Studies in Agriculture, CRC Press, Taylor & Francis Group, Boca Raton, U.S.A.
- Seemann J., Chirkov Y. I., Lomas, J. and Primault B. 1979. Agrometeorology. Springer-Verlag Berlin Heidelberg.Ebi Kristie L., 2009. Biometeorology for adaptation to climate variability and change. Springer Science + Business Media B.V., USA.

6. TEACHERS:

THEORY:
Athanasios Kamoutsis, Assistant Professor

LABORATORY:
Athanasios Kamoutsis, Assistant Professor
Fotoula Droulia, Laboratory Teaching Staff
Aristidis Matsoukis, Laboratory Teaching Staff
Ioannis Charalampopoulos, Laboratory Teaching Staff