COURSE OUTLINE

1. GENERAL

SCHOOL	AGRICULTURAL AND FORESTRY SCIENCES		
DEPARTMENT	AGRICULTURAL DEVELOPMENT		
LEVEL OF STUDIES	7		
COURSE CODE	B0023	**SEMESTER**	4th
COURSE TITLE	Principles of Agronomy		

TEACHING ACTIVITIES *If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
Lectures and laboratory courses	3+2	5
Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.		

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	General Background
PREREQUISITES:	
TEACHING & EXAMINATION LANGUAGE:	Greek
COURSE OFFERED TO ERASMUS STUDENTS:	Yes
COURSE URL:	https://eclass.duth.gr/courses/OPE01236/

2. LEARNING OUTCOMES

Learning Outcomes

Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

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

- acquire and consolidate basic knowledge related to the growth, development and adaptability of plants – especially large crops (HMDs), as well as to the effects that the environment (soil and airborne) exerts on agriculture.
- become familiar, through theoretical approaches and laboratory exercises, with the practical problems of Greek Agriculture, so that, as tomorrow's Agronomists, they will be able to respond successfully to their professional life and contribute to the proper guidance of producers in the cultivation of plants that combine high yield and optimal quality.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

- Independent work and Teamwork: As part of laboratory exercises the students work, individually and in groups, in the Laboratory of Agronomy and in the Farm of Democritus University on various practical items associated with Field Crops (such as seed recognition,

seed germination, preparation and establishment of the student field, basic principles of fertilization).
- Decision making: Through several case studies the students are familiarized in decisions on resolving the most important problems related with Field Crops.
- Literature search, data analysis and synthesis
- Development of inductive thinking

3. COURSE CONTENT

1. Introduction – Course Contents – Course structure
2. Agriculture and its evolution. Agriculture as an art, science, and business. Historical retrospection: The most important crops.
3. The agricultural resources of Greece. Agriculture and human survival. The contribution of agriculture to the national economy.
4. The plants. Diversification and evolution of cultivated species. The origin of cultivated plants. Classification, anatomy, and morphology of field crops. Identification of plants - Basic knowledge of anatomy. Growth and yield of crops (photosynthesis, assimilation of CO2, respiration, plant canopy and plant growth, leaf surface, architecture of the plant canopy). Performance and components of performance.
5. Environment and plant growth. Climatic factors. The energy factor. Light (effects of light on plants, solar radiation and crop productivity, ways to better exploit solar radiation from crops). Heat (The effects of temperature on plants, vegetative period of plants and growing zones, frosts, plant damage from cold, hardening or hardening of plants in cold, agricultural techniques to avoid plant damage from cold, plant damage from high temperatures).
6. Agriculture's needs for auxiliary energy
7. Water - atmospheric precipitations (prey). Distribution of rainfall and temperature trajectory, favorable effects of rain on crops (excluding water supply), adverse effects of rains. Snow (favorable and adverse effects), hail, dew, water losses, adaptation of plants to the lack of water, effect of water shortage in agriculture, treatment of water shortage, excess moisture, hydroponics.
8. Atmospheric factor, wind
9. The soil. Living organisms of the soil, soil treatment and machining systems, machining machines, energy in agriculture.
10. Plant nutrition – fertilization. Inorganic nutrients, the role of minerals, fertilizers, nitrogen transformations in the soil, nitrogen additions to the soil, chemical fertilizers, assessment of crops' nutrient needs.
11. Seed and sowing. Criteria for the quality of the seed, control of the germination capacity of the seed, germination and germination capacity, factors affecting the germination and germination of the seeds, the lethargy of the seeds, the longevity of the seeds.
12. Factors affecting the establishment of the crop. Sowing in the field (depth, density, way, sowing time), cultivation treatments along with sowing, seed production, seed control and processing of seeds measures the harvest.
13. Cultivation systems (monoculture, varied cultivation, continuous cultivation, multiple cultivation, co-cultivation, crop rotation, set-aside).

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Lectures in the classroom, Laboratory exercises at the Laboratory of Agronomy and at the Farm of the University
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY	• Use of information technologies (power point, video)

(ICT) *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	• On-line databases • Communication via e-mail and the e-class online platform
TEACHING ORGANIZATION *The ways and methods of teaching are described in detail.* *Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.* *The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.*	

Activity	*Workload/semester*
Lectures	39
Laboratory exercises in groups in the Lab. of Agronomy and in the University Farm	26
Independent Study	60
Total course (25 hours of workload per credit unit)	125

STUDENT EVALUATION *Description of the evaluation process* *Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others* *Please indicate all relevant information about the course assessment and how students are informed*	The evaluation of students is carried out as follows: • Language of assessment: Greek • Written evaluation in the theoretical part at the end of the semester. • Written evaluation in the laboratory (80%) and obligation to deliver a seed collection (20%) at the end of the semester. • The final performance is obtained by combining the grades of the theory (80%) and the laboratory (20%).

5. SUGGESTED BIBLIOGRAPHY

Selected Textbooks in the Eudoxus system

- Καραμάνος Α. 2011. Γενική Γεωργία. Αρχές Φυτικής Παραγωγής στις Αροτραίες Καλλιέργειες. Εκδόσεις «Παπαζήσης», σελ. 568.
- Δόρδας Χρ. 2012. Μαθήματα Γενικής Γεωργίας. Εκδόσεις «Σύγχρονη Παιδεία», σελ. 340.

Additional bibliographic resources will be available to students during the course

ANNEX OF THE COURSE OUTLINE

Alternative ways of examining a course in emergency situations

Teacher (full name):	Spyridon Koutroubas
Contact details:	skoutrou@agro.duth.gr
Supervisors: (1)	YES
Evaluation methods: (2)	• *written assignment or/and exercises* • *written or oral examination with distance learning methods, provided that the integrity and reliability of the examination are ensured.*
Implementation Instructions: (3)	The examination in the course will take place through the e-class and Skype for Business platform Students should connect to the e-class with the use of their institutional account and go to the course page*(it is a prerequisite to have registered for the course)* (https://eclass.duth.gr/courses/OPE01236/) and to the section "EXERCISES", where they will be given the exam form which they will fill in electronically. At the same time, students should log in to Skype for Business,following the link posted in the announcements of the course on the e-classplatform. Each student will have to answer 25 multiple-choice questions, each of the questions being scored 0.4 and there will be a negative score for the wrong answers (not for the blank ones) equal to half of the correct answer. The duration of the examinations will be 25 minutes. **Beneficiaries of participation in examinations** ▪ On the page of the course in thee-class and in the section "DOCUMENTS" before the examination period, a list will be posted with the AEM of the beneficiaries to participate in the examination. This list will be updated by the day of the beginning of the examination period. In order for the student to participate in the examinations, he/she must have read and accepted the terms of his/her participation in the examination process. This can be done through the page https://students.duth.gr and from the menu "Service", by going to the option "Participation in the next exam period". In addition, he/she must have registered for the course on the e-class page.

(1) Please write YES or NO

(2) Note down the evaluation methods used by the teacher, e.g.

- *written assignment* or/and exercises
- written or oral examination with distance learning methods, provided that the integrity and reliability of the examination are ensured.

(3) In the **Implementation Instructions** section, the teacher notes down clear instructions to the students:

a) in case of **written assignment and / or exercises:** the deadline (e.g. the last week of the semester), the means of submission, the grading system, the grade percentage of the assignment in the final grade and any other necessary information.

b) in case of **oral examination with distance learning methods:** the instructions for conducting the examination (e.g. in groups of X people), the way of administration of the questions to be answered, the distance learning platforms to be used, the technical means for the implementation of the examination (microphone, camera, word processor, internet connection, communication platform), the hyperlinks for the examination, the duration of the exam, the grading system, the percentage of the oral exam in the final grade, the ways in which the inviolability and reliability of the exam are ensured and any other necessary information.

c) in case of **written examination with distance learning methods**: the way of administration of the questions to be answered, the way of submitting the answers, the duration of the exam, the grading system, the percentage of the written exam of the exam in the final grade, the ways in which the integrity and reliability of the exam are ensured and any other necessary information.

There should be an attached list with the Student Registration Numbers only of students eligible to participate in the examination.