

COURSE OUTLINE

1. GENERAL INFORMATION

SCHOOL	APPLIED ECONOMIC AND SOCIAL SCIENCES		
ACADEMIC UNIT	AGRIBUSINESS AND SUPPLY CHAIN MANAGEMENT		
LEVEL OF STUDIES	<i>Undergraduate</i>		
COURSE CODE	5204	SEMESTER	2nd
COURSE TITLE	AGRONOMY		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	CREDITS
Lectures		5	5
COURSE TYPE	Special Background		
PREREQUISITE COURSES:	NO		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://oeclass.aua.gr/eclass/		

2. LEARNING OUTCOMES

Learning Outcomes	
<p>The aim of this course is to introduce students to the basic principles of agronomy for sustainable agriculture. It deals with agronomy as a complex, integrative subject at the crossroads of many disciplines (crop ecology, agrometeorology, soil science, agricultural engineering).</p> <p>Upon successful completion of the course the student will be able to:</p> <ul style="list-style-type: none"> ● understand and evaluate biotic and abiotic factors affecting crop production ● become familiar with farming practices that can be applied to rural ecosystems ● become familiar with specific crop production techniques which can be applied to major field crops ● identify the main factors affecting management decisions and on how to get quantitative answers to agronomic problems in the context of making current agricultural systems more sustainable 	
General Competences	
<ul style="list-style-type: none"> ● Adapting to new situations ● Decision-making ● Individual/Independent work ● Group/Team work ● Development of free, creative and inductive thinking 	

3. SYLLABUS

<p>1. Aerial environment (I) (effects of variables on the growth, yields and quality of the final products of field crops)</p> <ul style="list-style-type: none"> ○ Solar radiation: Effects of solar radiation on crop productivity and possibilities for interventions to improve crop production. ○ Temperature: Effect on biological processes of plants. Damages from extreme temperatures. General effects of temperatures in Agronomy. Characterization of plants based on their thermal requirements. Possibilities of interventions to improve production.

2. Aerial environment (II) (effects of variables on the growth, yields and quality of the final products of field crops)
 - Atmospheric humidity: Rainfall. Time distribution of rainfall and its importance for agriculture. Rainfall efficiency and possibilities of interventions to improve crop production.
 - Wind: Direct and indirect effects of wind on plants and possibilities of interventions to improve crop production.
 - Evapotranspiration: Effect on crop production. Water consumption of the plantation and possibilities of interventions to improve crop production.
 - Concentration of CO₂: Impact on crop production and possibilities of interventions to improve crop production.
3. Soil environment (effects of variables on the growth, yields and quality of the final products of field crops)
 - Definition and characteristics of agricultural soil
 - Soil composition and texture (soil air, water)
 - Soil formation factors
 - Soil profile
 - Soil physical properties: Soil structure, soil color, soil temperature, porosity, clotting and dispersion.
 - Soil chemical properties: Basic elements, Cation exchange capacity, Anion exchange capacity, Soil acidity (pH), Alkaline, saline and sodium soils.
 - Soil biological properties: Microfauna, mesofauna, macrofauna, organic matter, soil enzymes, CO₂ release - soil respiration.
4. Cultivation Techniques
 - Soil tillage: Types and objectives. Effect on soil and plant characteristics. Soil cultivation machines. Intervention time. Treatment methods (intensive, reduced, raw).
 - Fertilization: General. Types of fertilizers. The dynamics of nutrients in the soil and their uptake by the plant. Organic, green fertilization. Fertilizer application time. Methods of fertilizer application (dispersion, linear application, local application, hydro-fertilization, foliar fertilization)
 - Irrigation: Value of irrigation. Irrigation system selection criteria. Types of irrigation systems. Irrigation planning. Quantity and quality of irrigation water.
 - Sowing: Factors affecting the crop establishment. Depth, density, time and manner of sowing cultivation.
 - Crop rotation: Objectives and basic principles. Monoculture, set-aside, crop rotation in arid and irrigated areas. Intercropping.
5. Temperate Climate Cereals (Wheat, Oats)
 - For each species are examined: General elements - origin and distribution, economic importance and uses, development, adaptability (climatic and soil requirements), cultivation technique (crop rotation, soil treatment, inorganic nutrition and fertilization, sowing, water requirements and irrigation, maturation and harvest, main enemies and diseases), products and quality characteristics.
6. Temperate Climate Cereals (Barley, Rye and Triticale)
 - For each species are examined: General elements - origin and distribution,

economic importance and uses, development, adaptability (climatic and soil requirements), cultivation technique (crop rotation, soil treatment, inorganic nutrition and fertilization, sowing, water requirements and irrigation, maturation and harvest, main enemies and diseases), products and quality characteristics.

7. Warm Climate Cereals (Maize)

- For each species are examined: General elements - origin and distribution, economic importance and uses, development, adaptability (climatic and soil requirements), cultivation technique (crop rotation, soil treatment, inorganic nutrition and fertilization, sowing, water requirements and irrigation, maturation and harvest, main enemies and diseases), products and quality characteristics.

8. Warm Climate Cereals (Rice)

- For each species are examined: General elements - origin and distribution, economic importance and uses, development, adaptability (climatic and soil requirements), cultivation technique (crop rotation, soil treatment, inorganic nutrition and fertilization, sowing, water requirements and irrigation, maturation and harvest, main enemies and diseases), products and quality characteristics.

9. Legumes (for seed production)

- For each species are examined: General elements - origin and distribution, economic importance and uses, development, adaptability (climatic and soil requirements), cultivation technique (crop rotation, soil treatment, inorganic nutrition and fertilization, sowing, water requirements and irrigation, maturation and harvest, main enemies and diseases), products and quality characteristics.

10. Legumes (for hay production)

- For each species are examined: General elements - origin and distribution, economic importance and uses, development, adaptability (climatic and soil requirements), cultivation technique (crop rotation, soil treatment, inorganic nutrition and fertilization, sowing, water requirements and irrigation, maturation and harvest, main enemies and diseases), products and quality characteristics.

11. Industrial Crops (Cotton, Tobacco)

- For each species are examined: General elements - origin and distribution, economic importance and uses, development, adaptability (climatic and soil requirements), cultivation technique (crop rotation, soil treatment, inorganic nutrition and fertilization, sowing, water requirements and irrigation, maturation and harvest, main enemies and diseases), products and quality characteristics.

12. Industrial Crops (Sugar beet, Processing Tomato)

- For each species are examined: General elements - origin and distribution, economic importance and uses, development, adaptability (climatic and soil requirements), cultivation technique (crop rotation, soil treatment, inorganic nutrition and fertilization, sowing, water requirements and irrigation, maturation and harvest, main enemies and diseases), products and quality characteristics.

13. Oil Crops (Sunflower)

- For each species are examined: General elements - origin and distribution, economic importance and uses, development, adaptability (climatic and soil requirements), cultivation technique (crop rotation, soil treatment, inorganic nutrition and fertilization, sowing, water requirements and irrigation, maturation and harvest, main enemies and diseases), products and quality characteristics.

A combination of teaching and learning methods will be used, aiming at the active participation of the students; there will be lectures using audiovisual media, discussions, group activities, as well as projections of relevant videos. The students will also undertake an individual or group project. Furthermore, articles, audiovisual lecture materials, web links/addresses, useful information, are posted in digital form on the AUA Open e-Class platform.

4. TEACHING METHODS--ASSESSMENT

MODES OF DELIVERY	Face to face														
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	<ul style="list-style-type: none"> ● Support of the learning process through the AUA Open eClass platform of the University (Integrated Electronic Course Management System) ● Support of the lectures using presentation software ● Use of audiovisual material ● Use of Internet applications <p>Communication with students: face to face at office hours, email, eclass platform</p>														
TEACHING METHODS	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;"><i>Activity</i></th> <th style="text-align: center;"><i>Workload</i></th> </tr> </thead> <tbody> <tr> <td>Lectures (direct)</td> <td style="text-align: center;">65</td> </tr> <tr> <td><i>Writing paper/ papers</i></td> <td style="text-align: center;">28</td> </tr> <tr> <td><i>Independent Study</i></td> <td style="text-align: center;">30</td> </tr> <tr> <td><i>Advisory support</i></td> <td style="text-align: center;">0.5</td> </tr> <tr> <td><i>Exams</i></td> <td style="text-align: center;">2</td> </tr> <tr> <td><i>Course Total (Approximately 25 hours of workload per credit unit 125.5)</i></td> <td style="text-align: center;">125.5 h</td> </tr> </tbody> </table>	<i>Activity</i>	<i>Workload</i>	Lectures (direct)	65	<i>Writing paper/ papers</i>	28	<i>Independent Study</i>	30	<i>Advisory support</i>	0.5	<i>Exams</i>	2	<i>Course Total (Approximately 25 hours of workload per credit unit 125.5)</i>	125.5 h
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STUDENT EVALUATION	<p>PERFORMANCE</p> <p>The evaluation process is in the language that the course is taught (Greek or English) and consists of:</p> <ol style="list-style-type: none"> i. Compulsory written final examination at the end of the semester (weighting factor 70% at least) which may includes: <ul style="list-style-type: none"> ● Multiple choice questionnaires ● Open-ended questions ● Problem solving ● Oral examination <p>Evaluation criteria: correctness, completeness, clarity</p> ii. Optional written exam or essay during the semester (weighting factor 30%) which may includes: <ul style="list-style-type: none"> ● Multiple choice questionnaires ● Open-ended questions ● Problem solving ● Essay/report ● Oral examination <p>Evaluation criteria: correctness, completeness, clarity</p> <p>Special learning difficulties: Students with special learning difficulties in writing and</p>														

reading (as they are certified and characterized by a competent body) are examined based on the procedure provided by the Department.

Specifically-Defined Criteria:

The evaluation criteria are made known during the first lesson and are clearly stated on the course website and the AUA Open e-class platform. The answers to the exam questions are posted on the AUA Open e-Class platform after the exam. The students are allowed to see their exam paper after its grading (during the announced office hours) and receive explanations about the grade they received.

5. ATTACHED BIBLIOGRAPHY

Suggested Bibliography in Greek Language:

- Μπιλάλης, Δ. Παπαστυλιανού & Τραυλός, Η.Σ. (2018). *Γεωργία: Φυτά μεγάλης καλλιέργειας*. Εκδόσεις Πεδίο.
- Δόρδας, Χ. (2018). *Γενική Γεωργία*. Εκδόσεις Σύγχρονη παιδεία.

Suggested Bibliography in English Language:

- Villalobos, F.J. & Fereres, E. (2016). *Principles of Agronomy for Sustainable Agriculture*. Springer International Publishing.
- Sadras, V.O. & Calderini, D.F. (2015). *Crop physiology: applications for genetic improvement and agronomy*. Academic Press, Elsevier Inc.

Related academic journals:

- *Agronomy Journal*
- *European Journal of Agronomy*
- *Agronomy*
- *Crop Science*
- *International Journal of Agronomy*
- *Journal of Agronomy and Crop Science*
- *Archives of Agronomy and Soil Science*
- *Advances in Agronomy*
- *Agricultural and Forest Meteorology*
- *Agricultural Water Management*
- *Agronomy for Sustainable Development*
- *Annals of Applied Biology*
- *Computers and Electronics in Agriculture*
- *Environmental and Experimental Botany*
- *Field Crops Research*
- *Industrial Crops and Products*
- *Journal of Cereal Science*

- *Soil and Tillage Research*
- *Weed Science*
- *Agronomy Research*
- *Sustainability*
- *Agriculture*
- *Plants*