TECHNOLOGICAL EDUCATIONAL INSTITUTE OF PELOPONNESE

SCHOOL OF AGRICULTURAL TECHNOLOGY, AND FOOD TECHNOLOGY AND NUTRITION

DEPARTMENT OF AGRICULTURAL TECHNOLOGY

COURSE SYLLABUS

KALAMATA, MARCH OF 2016

A. COMPULSORY COURSES

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	101	**SEMESTER**	1st (Winter)
COURSE TITLE:	**INTRODUCTION TO AGRICULTURE SCIENCE AND METHODOLOGY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Practice	2+2	6	
COURSE TYPE:	Infrastructure Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The lesson aims: To provide to the students the necessary import knowledge to understand the basics of science are invited to study at the Department of Agricultural Technology of the TEI of Peloponnese Upon successful completion of this course, students will be able: • To understand the basics of science and technology who are invited to study • To realize the possibilities of scientific careers • To realize the business potential • To understand the methodology of science and technology who are invited to study
Competencies
• Search, analysis and synthesis of data and information, using the necessary technologies • Adapting to new situations • Autonomous working • Collaborative working • Respect for the natural environment • Working in an international environment • Work in interdisciplinary environment • Causes for new research ideas • Promotion of free, creative and inductive thinking

COURSE TOPICS and SCHEDULE

Theory:

Plant fundamentals (main functions and needs of the plant)

Basic principles of agricultural production (Evolution, Structure, Trends, Perspectives)

The importance of agriculture (Food security, Economy, Policies, National and World importance)

The importance of Agricultural Science-Technology (The role of the Agronomist, Organizing agricultural production in operational base, Plant Protection, Resource management and agricultural techniques, Environmental Monitoring, Environmental Protection)

Scientific Disciplines of Agronomy (The main branches of Agricultural Science and the object of their study. Professional perspectives).

The methodology of Agricultural Science-Technology (Bibliographic databases, Libraries, Laboratory-analytical techniques, Research-Experimentation, New technologies)

Practice:

- In the connection of research objects with the Agriculture Technology.
- In writing scientific papers.
- In the use of Literature.
- In new technologies.

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload*** Lectures: 26 *Practice*: 26 Shelf-study: 104 ***Total workload in hours***: ***156***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Written final exam in the theoretical part (100%) including questions that require critical ability and giving the opportunity to develop knowledge and analytical approach In the Lab: weekly ratings (30%). Written term exam (70%) including: - Multiple choice questions - Problem-solving

TEXTBOOK and OPTIONAL READING

Optional Reading:

- Δόρδας, Χ., 2009. Μαθήματα Γενικής Γεωργίας. Εκδόσεις Σύγχρονη Παιδεία.
- Κανάκης, Α., 2003. Γενική Λαχανοκομία. Αγρότυπος ΑΕ, Αθήνα.
- Καραμπέτσος, Ι., 2005. Βοτανική: Μορφολογία και Ανατομία Φυτών. Εκδόσεις Έμβρυο, Αθήνα.
- Καράταγλης, Σ. 1999. Φυσιολογία Φυτών. Εκδόσεις Χάρις Μ. ΕΠΕ.
- Μαυρογιαννόπουλος Γ. Ν. ,2005, «Θερμοκήπια» Έκδοση Δ΄, Εκδόσεις Σταμούλη Α. Ε., Αθήνα , σελ.21-653.
- Ποντίκης, Κ.Α., 1997. Γενική Δενδροκομία. Εκδόσεις Σταμούλη, Αθήνα.
- Σάββας, Δ. 2003. Ανθοκομία. Εκδόσεις έμβρυο, Αθήνα.
- Σιδηράς, Κ.Ν., 2005. Βιολογική Γεωργία, Φυτική Παραγωγή. Εκδόσεις ΔΗΟ, Αθήνα.
- Σινάνης, Κ., 2009. Εδαφολογία. Εκδότης Σινάνης, Ηράκλειο.
- Σταθάς, Γ.Ι., 2012. Γεωργική Εντομολογία & Ζωολογία. (Διδακτικές σημειώσεις).ΤΕΙ Καλαμάτας.
- Ηλιόπουλος Α., Γενική Φυτοπαθολογία, Εκδόσεις Έμβρυο, Αθήνα, 2004.
- Dent, D.R. and Walton, M.P., 1997. Methods in ecological & agricultural entomology. Cab International, London, Washington.
- Jones, J.B., Jr., B. Wolf and H.A. Mills. 1991. Plant Analysis Handbook. Micro-Macro Publishers. Athens. GA.
- Weier, E. T., 1982. '' Botany : an introduction to plant biology'', Έκδοση 6η, John Wiley & Sons New York.

OVERVIEW

SCHOOL:	Agricultural Technology and, Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	102	**SEMESTER**	1st (winter)
COURSE TITLE:	**PLANT MORPHOLOGY AND ANATOMY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Lab Exercises	3+3=6	6	
COURSE TYPE:	General Infrastructure Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/ TTG106		

SKILL DEVELOPMENT

Course Description and Learning Objectives

The course aims at familiarizing students with:

- the internal (anatomic) structure of the plant body;
- the external morphology of the plant body, and
- the plant's reproduction methods with emphasis on cultivated plants

At the end of the course the student should

- have basic knowledge about the plant cell's structure and functions
- have basic knowledge about the plant's structure and growth
- have basic knowledge concerning the plant's adaptations on growth and development due to internal and external factors
- be able to work with plant samples using light microscope

Competencies

Decision-making
Working individually
Team working
Promotion of free, creative and inductive thinking
Ability in the use of the light microscope for making observations on plant sections

COURSE TOPICS and SCHEDULE

A. The Plant Cell:
Chemistry
Components
Structure
Function
Morphological types
Division

C. Morphology and Anatomy of the plant organs:
Stem
Leaf
Root
Flower
Fruit
Seed

D. Plant Reproduction

B. Tissues and tissue Systems of the plant body

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of Information Technology during teaching and communication with the students: 1. PowerPoint presentations. 2. Student contact electronically and face-to-face in weekly office hours. 3. Use of the electronic platform e-class (course web page).
METHODS OF INSTRUCTION	***Method*** / ***Semester workload*** Lectures: 39 Labs: 39 Individual study: 78 ***Total workload in hours***: ***156***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Written term exam that includes: - Multiple choice questions - Sort answer questions Witten lab midterm and final exams that include: - identification of different plant parts and organs - questions concerning sample preparation and staining techniques - sort answer questions

TEXTBOOK and OPTIONAL READING

SUGGESTED LITERATURE :

- Balbach, M. and L. C. Bliss, 1991. A Laboratory Manual for Botany (7th edition). New York: Sauders College Publishing.
- Bell, A. D., 1991. Plant Form: An Illustrated Guide to Flowering Plant Morphology. Oxford; New York: Oxford University Press.
- Briggs, D. and S. M. Walters, 1997. Plant Variation and Evolution (3rd edition). United Kingdom: Cambridge University Press.
- Brum, G. D., L. K. McKane and G. Karp, 1994. Biology: Exploring Life (2nd

edition). New York: John Wiley & Sons Inc.
- Crawley, M. J., 1998. Plant Ecology (2nd edition). Great Britain: Bla. Science
- Cresti, M., S. Blackmore and J. L. van Went, 1992. Atlas of Sexual Reproduction in Flowering Plants. Berlin; Heidelberg: Springer - Verlag.
- Evert, R.F. and S.E. Eichorn, 1992. Laboratory Topics in Botany (5th edition). U.S.A.: Worthy Publishers.
- Fahn, A., 1990. Plant anatomy (4th edition). Oxford; New York: Pergmon Press.
- Glace, J. C. and J. A. Waldvogel, 1995. Life: The Science of Biology (5th edition). Sinauer Assos. Inc.
- Postlethwait, J. H. and J. L. Hopson, 1992. The Nature of Life (2nd edition). USA: McGraw-Hill Inc.
- Raven, P. H., R. F. Evert and S. E. Eichorn, 1992. Biology of Plants (5th edition). New York: Worth Publishers Inc.
- Stern, K. R., 1991. Plant Biology (5th edition). USA: Wm. C. Brown Publishers.
- Sugden, A., 1993. Longman Botany Handbook: The Elements of Plant Science Illustrated and Defined (3rd edition). Hong Kong: Lon. York Press.

AGRICULTURAL ENGINEERING

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	Undergraduate		
COURSE CODE:	104	**SEMESTER**	1st Fall
COURSE TITLE:	**AGROMETEOROLOGY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratories	2+2=4	5	
COURSE TYPE:	General Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG103/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The lesson of Agrometeorology, is an object of Agricultural Science, which belongs to the lessons of general infrastructure, and which has to do with the understanding of the climate – weather – plant interactions. It‘s surely one of the basic factors that the Agriculturist has to take under consideration in order to give an advice, or to implement a study. The learning results correspond to level 6, where the knowledge given are advanced for the working field , and which in turn mean the critical understanding of the theories and the principles of Agrometeorology The lesson intends to introduce the students to the Science of Agrometeorology, and to orient the successfully attended with the following meanings: • Atmosphere • Meteorological Station • Sun Radiation • Temperature • Atmospheric pressure • Wind • Water • Forecasts and crops production • Climate and microclimate
Competencies
Decision making Working individually Team working Respect to the natural environment Be self-aware and use sound judgment Promotion of free, creative and inductive thinking

COURSE TOPICS and SCHEDULE

Lecture – Practice

- Meteorological station; types, meteorological sensors, measurement units, data and data elaboration
- Atmosphere, composition, changes of temperature, pressure and density according to height ,
- Sun radiation, radiation law of black body, earth radiation, total sun radiation, energy balance, sun radiation and plant organisms
- Air temperature, soil temperature, water temperature, plants and temperature, livestock and temperature
- Atmospheric pressure, changes, isobar curves, pressure gradient,
- Wind, causes and the mechanism of wind creation, winds distinction, wind and plant organisms, wind protection
- Air humidity, evaporation, evapotranspiration, clouds, nebulosity, small scale condensation, atmospheric precipitation
- Air masses, fronts, depressions, anticyclones, storms, tornadoes,
- Special forecasts and crop production, agrometeorological forecasts
- Climate distinction, bioclimate distinction, climate conditions and vegetation type of various areas of Earth, climate framework of the Greek region,
- Microclimates

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class and at the meteorological station
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Lecturing (*the exercises etc.*) is being supported by the e-class learning platform
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	26
Practice	26
Shelf-study	104
Total workload in hours	***156***

STUDENT LEARNING ASSESMENT	Assessment language: Greek, English (ERASMUS) Assessment method: The examination in Lectures is comprised of Multiple Choice, Questions for Short Answers. Potentially, the examination can be oral, only in obligatory cases. The evaluation of the practice, is the average grade of exercises taken after finishing each chapter; the average grade is the 20% of the final grade.

SUGGESTED LITERATURE

TEXTBOOK

- http://www.wmo.int/pages/prog/wcp/agm/gamp/documents/WMO_No134_en.pdf

OPTIONAL READING

- http://www.fao.org/nr/climpag/pub/Agricultural%20and%20Forest%20Meteorology%202000%20Sivakumar%20Gommes%20Baier.pdf

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	105	**SEMESTER**	1st (winter)
COURSE TITLE:	**MATHEMATICS FOR THE LIFE SCIENCES I**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Practice	2+2=4	5	
COURSE TYPE:	General Infrastructure Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course objective is to provide an introduction for students to the necessary mathematical knowledge for the agronomic science and technology and help them to become familiar with math applications, in order to determine the substantial utility in the study and deeper understanding of the Agriculture sector. Upon successful completion of this course, students will be able to demonstrate an understanding of: • The Limit of single variable real functions. • The Derivative of single variable real functions. • Applications of the Derivative in life science problems. • The anti-derivative of single variable real functions. • The Indefinite Integral of single variable real functions. • The Definite Integral of single variable real functions. • Applications of the Integral in life science problems.
Competencies
Decision-making Autonomous working Collaborative working Advancement of a free, productive and inductive mind

COURSE TOPICS and SCHEDULE

1. Single variable real functions
2. Limit of single variable real functions.
3. Derivative of single variable real functions.
4. Derivative of important single variable real functions.
5. Function optimization using derivative.
6. Study of a single variable real function.
7. Applications of the Derivative in life science problems.

8. Anti-derivative of single variable real functions.
9. Anti-Derivative of important single variable real functions.
10. Indefinite Integral of single variable real functions.
11. Definite Integral of single variable real functions.
12. Methods of Integration of single variable real functions.
13. Applications of the Integral in life science problems.

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload*** Lectures: 26 Practice (problem solving): 26 Shelf-study: 104 ***Total workload in hours***: ***156***
STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Written term exam that includes: - Multiple choice questions - Problem-solving

TEXTBOOK and OPTIONAL READING

Textbooks:

- George B. Thomas, Jr., Maurice D. Weir, Joel Hass (2014), Thomas' Calculus (13th Edition), Pearson, 13 edition, ISBN: 9780321878960
- Michael Spivak, Calculus, 4th edition, ISBN: 9780914098911
- Bodine, Erin N., Lenhart, Suzanne, Gross, Louis J. (2014), Mathematics for the Life Sciences, Princeton University Press, ISBN: 9780691150727
- Ledder Glenn (2013), Mathematics for the Life Sciences, Springer-Verlag New York, ISBN: 9781461472759
- Istas Jacques (2005), Mathematical Modeling for the Life Sciences, Springer-Verlag Berlin and Heidelberg GmbH & Co. KG, ISBN: 9783540253051

GENERAL CHEMISTRY

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	201	**SEMESTER**	2nd (Spring)
COURSE TITLE:	**PLANT PHYSIOLOGY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Practice	3+3	6	
COURSE TYPE:	Infrastructure Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives

The course objective is to provide to the students knowledge on the cell and plant functions as well as the influence of internal and external factors on these functionsa0

Upon successful completion of this course, students will be able to demonstrate an understanding of:

- The basic physiological functions of the plant cell and the plant as a living organism
- To understand the plant's response to various abiotic stresses
- The interpretation of the behavior of the plant in the field and the greenhouse as for regular and productive development
- The capability to take corrective measures to optimize crop yields

Competencies

- Search, analysis and synthesis of data and information, using the necessary technologies
- Adapting to new situations
- Autonomous working
- Collaborative working
- Respect for the natural environment
- Working in an international environment
- Work in interdisciplinary environment
- Causes for new research ideas
- Promotion of free, creative and inductive thinking
- Decision-making

COURSE TOPICS and SCHEDULE

The movement of water and nutrients to the plant cell

- *Principles of water movement*
- *Massive flow – Diffusion-Osmosis*
- *Transfer of solutes through membranes*

The movement of water and nutrients in plant

- *Transpiration*
- *Factors affecting the rate of transpiration*
- *Water Transfer: the mechanism of Relevance-cohesion-Tension*
- *Transport of inorganic Nutrients*
- *Movement of substances in phloem-Translocation*

Physiology of plant nutrition

- *General nutrition requirements*
- *Essential Mineral Nutrient*
- *Concentrations of nutrients in plants*
- *Functions of inorganic nutrients in plants*

Energy flow in plant cell

- *Basic principles*
- *Laws of thermodynamics-Entropy*
- *Metabolism – Enzymes-ATP*

Photosynthesis

- *The nature of light*
- *Photosynthetic pigments- Photosystems*
- *Light phase-Dark phase*
- *Carbon fixation in C3 and C4 plants*
- *Factors affecting photosynthesis*

Respiration

- *Fundamentals (Glycolysis, Krebs Cycle, Oxidative phosphorylation)*
- *Substances that respiration breaks down -Respiratory quotient*
- *Factors affecting respiration*
- *Anaerobic respiration*

Growth, development and differentiation of plant.

- *Exogenous and endogenous factors of growth and development.*
- *Plant Hormones: Auxins-Cytokinins-Ethylene-Gibberillines-ABA.*
- Tropisms-Daily periodic motions
- Photoperiodism – Phytochrome

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION	The teaching and learning process is supported by the electronic platform of e-class

TECHNOLOGIES	
METHODS OF INSTRUCTION	

Method	*Semester workload*
Lectures	39
Practice (laboratories)	39
Shelf-study	78
Total workload in hours	***156***

STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Written final exam in the theoretical part (100%) including questions that require critical ability and giving the opportunity to develop knowledge and analytical approach In the Lab: weekly ratings (30%). Written term exam (70%) including: - Multiple choice questions - Problem-solving

TEXTBOOK and OPTIONAL READING

Textbooks:

- Καραμπέτσος Ιωάννης, 1999. "ΦΥΣΙΟΛΟΓΙΑ ΦΥΤΩΝ", ΤΕΙ Καλαμάτας, Σημειώσεις.

Optional Reading:

- Καράταγλης Στυλιανός, 1999. "ΦΥΣΙΟΛΟΓΙΑ ΦΥΤΩΝ", Εκδ. ART of TEXT, Θεσσαλονίκη, ISBN 960-312-009-X,
- Πασπάτης Ευάγγελος, 1998. "ΦΥΤΟΡΡΥΘΜΙΣΤΙΚΕΣ ΟΥΣΙΕΣ (ΦΥΤΟΡΜΟΝΕΣ)", Εκδόσεις 'Αγρότυπος' Αθήνα, ISBN 960 7667 06 9.
- Ρουμπελάκη – Αγγελάκη Κ. (Επιμέλεια) 2003. "ΦΥΣΙΟΛΟΓΙΑ ΦΥΤΩΝ Από το μόριο στο περιβάλλον " Πανεπιστημιακές Εκδόσεις Κρήτης, ISBN: 960-524-168-4
- Allaby, M., '' THE CONCISE OXFORD DICTIONARY OF BOTANY'', 1992, Oxford University Press.
- Atkinson D., et al. 1980. Mineral nutrition of Fruit Trees. Butterworth & Co. London.
- Bennet, W. 1993. Nutrient Deficiencies & Toxicities In Crop Plants. APS Press. Minnesota, USA.
- Bould, C. et al. 1983. Diagnosis of Mineral Disorders in Plants. London.
- Dennis, D. T. Turpin, D. H., ''PLANT PHYSIOLOGY, BIOCHEMISTRY AND MOLECULAR BIOLOGY'' 1990, Longman Scientific & Technical, UK.
- Dey, P. M., Harborne, J. B., ''PLANT BIOCHEMISTRY'' 1997, Academic Press San Diego; London.
- Galston, A. W., ''LIFE PROCESSES OF PLANTS'' 1994, Scientific American Library New York .
- Jones, H. G., ''PLANTS AND MICROCLIMATE : A QUANTITATIVE APPROACH TO ENVIRONMENTAL PLANT PHYSIOLOGY'' 1992, Cambridge University Press.
- Lawlor D. W., Lawlor G. L., Mohr, H., Schopfer, P., ''PLANT PHYSIOLOGY'', 1995, Springer, New York.
- Marschner, H. 1997. Mineral Nutrition of Higher Plants. Academic Press. London.
- Ministry of Agriculture,'' PLANT PHYSIOLOGICAL DISORDERS'',Fisheries and Food,

1985, Her Majesty's Stationery Office, London.
- Mengel, K. and Kirkby E.A. 1979. Principles of plant nutrition. International Potash Institute. Bern, Switzerland.
- Moore, R., Vodopich S. D., Clark W. D., ‘’BOTANY’’ 1998, Έκδοση 2η,Boston; Massachusetts : WCB McGraw-Hill.
- Salisbury & Ross, ‘’PLANT PHYSIOLOGY’’, (1992, 4th Edition), Wadsworth Publishing company California.
- Taiz, L., Zeiger, E., ‘’PLANT PHYSIOLOGY’’, 1998, Έκδοση 2η Sinauer Associates, Inc., Publishers, Sunderland; Massachusetts

Weier, E. T., ‘’ BOTANY : AN INTRODUCTION TO PLANT BIOLOGY’’1982, Έκδοση 6η, John Wiley & Sons New York

OVERVIEW

SCHOOL:	**School of Agricultural Technology and Food Technology and Nutrition**		
DEPARTMENT:	**Agricultural Technology**		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	202	**SEMESTER**	2nd
COURSE TITLE:	**SOIL SCIENCE**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Lab. exercises	2+2=4	4	
COURSE TYPE:	Scientific Area		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG111/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course aims to provide an understanding of important soil physical, chemical and biological properties. On completion of the course students should be able to: 1. Distinguish key soil processes underlying the weathering as a procedure of soil formation, processes such as nitrification, ammonification, N-fixation, C:N ratio of materials returned to soil, N transformation, soil organisms that regulate growth of crop plants. 2. Demonstrate clear understanding of crop-soil interaction and its implication on crop growth and yield. 3. Develop an understanding of the effect of different physical and chemical properties on crop yield; in particular, recognize the significance of factors affecting cation-exchange capacity (CEC), acidity, alkalinity (pH) and salinity as soil factors determining crop yield. 4. Acquire knowledge of taking the appropriate agronomic measures in order to ameliorate acidic, alkaline and saline cultivated soils.
Competencies
Autonomous working and collaborative working Critical thinking and problem solving skills with respect to soil management to enable students to use the relevant knowledge to answer practical questions.

COURSE TOPICS and SCHEDULE

Specifically, the topics that will be taught are the following:
I. Definition of Soil (Soil Components - Air, Water, Inorganic and Organic Solids, Weathering as a process of soil formation)
II. Physical Properties (soil texture, structure, temperature, color, pore space, bulk density, particle density, soil water relationships, moisture constants (saturation, field capacity, wilt point, hygroscopic coefficient), availability of water to plants- factors affecting water holding capacity of soils - (texture, consistence, structure, organic

matter), etc
III. Chemical Properties (chemistry of clays, cation exchange capacity (CEC)-factors affecting CEC, acidity, alkalinity (pH) and salinity, percent base saturation, chemical reactions of lime in soil - factors affecting lime reaction in soil - liming materials)
IV. Biological Properties (Soil Organic Matter, Soil Organisms, functions, processes such as nitrification, ammonification, N-fixation, C:N ratio of materials returned to soil, N transformation, soil organism
V. Genesis and Classification (profile, soil forming factors, classification system, etc).

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class.
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	26
Laboratory exercises	26
Shelf-study	52
Total workload in hours	***104***

STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Written term exam that includes: - Multiple choice questions - Short answer questions

TEXTBOOK and OPTIONAL READING

1. Bolt, G.H. (et. al.), 1982. Soil Chemistry: Physico-chemical Models (2nd edition). Amsterdam; Oxford: Els.
2. Brady, N.C. and R.R. Weil. 2009. Elements of the Nature and Properties of Soils. 3 rd Ed. Pearson Education, Upper Saddle River, 14 NJ, USA.
3. Kramer, P.J. and J.S. Boyer. 1995. Water Relations of Plants and Soils. Academic Press, San Diego, CA, USA.
4. Cadisch, G. and K.E. Giller, 1997. Plant Litter Quality and Decomposition. United Kingdom: Cab. Int.
5. Hall, G.S., P. Lasserre and D.S. Hawksworth, 1996. Methods for the Examination of Organismal Diversity in Soils and Sediments. United Kingdom: Cab. Int.
6. Kumada, K., 1987. Chemistry of Soil Organic Matter. Tokyo, Amsterdam, Oxford: Jap. Sci. Soc. Press
7. Powlson, D.S., P. Smith and J.U. Smith, 1996. Evaluation of Soil Organic Matter Models using Existing Long-term Datasets. Berlin; Heidelberg; Springer.
8. Smith, K.A., 1991. Soil Analysis: Modern Instrumental Techniques (2nd edition). New York; Basel: mar. Dec.Inc.
9. Smith, K.A. and C.E. Mullins, 1991. Soil Analysis: Physical Methods. New York; Basel: Mar. Dec. Inc.

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	203	**SEMESTER**	2nd (spring)
COURSE TITLE:	**BIOMETRY – AGRICULTURAL EXPERIMENTATION**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Recitations	2+2=4	6	
COURSE TYPE:	General Infrastructure Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course objective is to familiarize students with the application of the principles and rules of statistics in biological disciplines and, especially, agronomy (biometry) and experimentation. Moreover, the course aims at introducing the students to the various data analysis and processing methods using computers and software packages (such as Microsoft Excel, Statistica, SPSS, etc) or statistical programming languages (such as R and R studio). Upon successful completion of this course, students will be able to demonstrate an understanding of: *Defining basic statistical concepts.* *Applying basic elements of the descriptive statistics.* *Defining basic concepts of the probability theory.* *Applying basic theoretical probability distribution.* *Applying elements of estimation.* *Applying the statistical assumption verification technique.* *Applying the technical analysis of the parallelism of data of simple experimental plans.* *Applying the technique of regression and data correlation.* *Applying statistical techniques and agricultural experiment in examples from agricultural practice.* *Applying basic techniques of agricultural experimentation.* *Implementing basic statistical techniques in a statistical package.*
Competencies
Decision-making Autonomous working Collaborative working Advancement of a free, productive and inductive mind

COURSE TOPICS and SCHEDULE

Introduction (course scope, basic concepts, random experiment, variability, variables,

population, sampling, sample).
Elements of descriptive statistics (concentration, presentation and summary of biometric data).
Basic theoretical distributions of probabilities and their applications in biological problems (binomial, polynomial, Poisson, normal, X2 and F distribution).
Elements of estimation (technique of calculating intervals or parameter confidence bounds of the distributions – applications in biological and agronomy problems).
Statistical assumption verification technique (distinction of cases between continuous and discrete data).
Basic elements of General Experiment. The technical analysis of the parallelism of data of simple experimental plans (fully randomized, randomized complete designed, Latin square).
Elements of regression - correlation of variables (calculation technique and interpretation of results using examples from the agricultural practice).

Practice (Lab):
Learning to manage a data analysis software (statistical package).
Implementation of the course's statistical techniques in the aforementioned statistical package.
Indicative examples of exercises from the agricultural practice per theoretical lesson to be performed by the student in the computer room assisted by the teacher.

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload***
	Lectures: 26
	Practice: 26
	Shelf-study: 104
	Total workload in hours: ***156***
STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Practice in Lab (20%). Written term exam (80%) that includes: - Multiple choice questions - Short answer questions - Problem-solving

TEXTBOOK and OPTIONAL READING

Textbooks:
Alan G. Clewer and David H. Scarisbrick, (2001), Practical Statistics and Experimental Design for Plant and Crop Science, Wiley, 1st edition, ISBN: 978-0471899099.
Usha Palaniswamy, (2005) ,Handbook of Statistics for Teaching and Research in Plant

and Crop Science, CRC Press, 1st edition, ISBN: 978-1560222934.
Sokal, R.R. and F.J. Rohlf. (2011), Biometry: The principles and Practice of Statistics in Biological Research. W. H. Freeman and Co, San Fransisco, C.A. 4th edition (September 16, 2011).

Additional Reading:

Crawley, M.J., (2012), The R Book. Wiley, 2nd edition.
Crawley, M.J., (2014), Statistics: An Introduction Using R, Wiley, 2nd edition.
Dalgaard, P., (2008), Introductory Statistics with R, Springer, 2nd edition.

OVERVIEW

SCHOOL:	Agricultural Technology & Food Technology and Nutrition		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	204	**SEMESTER**	2nd
COURSE TITLE:	**AGRICULTURAL GENETICS**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Practical Courses	2+2=4	4	
COURSE TYPE:	Agricultural Science		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG109/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The certain courses objective is to give students the basic principles of Genetics and to understand the nature of genetic material. In addition, the students have the opportunity to learn the function of the genes and how the genome is organized in different Kingdoms. Basic Mendelian rules of inheritance are presented in the theoretical courses as well as the phylogenetic analysis of certain DNA sequences. Furthermore, the students study basic genetic terms such as genetic recombination, mutations genetic markers and genetic map construction. At the end of theoretical courses the students are able to understand basic rules of inheritance, genome organization and analysis. The practical courses learn to the students how to solve genetic problems and the statistical analysis needed for genetic analysis.
Competencies
Basic rules of genetics Genome function understanding Phylogenetic analysis Gene function

COURSE TOPICS and SCHEDULE

<u>Unit 1: Genetic Material</u> 1. Chemistry of Genetic Material 2. The Function of DNA (DNA Replication) 3. The Function of RNA (RNA transcription and translation) <u>Unit 2: Cell Cycle</u> 4. Mitosis 5. Meiosis <u>Unit 3: Basic Genetics-Mendelian Genetics and Lows</u> 6. Monohybrid Cross

7. Dihybrid Cross
8. Epistasis, Genetic maps and recombination
9. Sex-based inheritance
10. Mutations
11. Plant Genome Plastidial genetic Material

Unit 4:

12. Phyllogenetic Analysis
13. Epigenetics

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	26
The lectures are available to the students in eclass platform. Furthermore, in the practical section in small group training courses the students have the opportunity to learn how to solve basic genetic problems.	26
Shelf-study	52
Total workload in hours	***104***

STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Optional Exams for the students during semester Written term exam that includes: - Multiple choice questions - Short answer questions In practical courses the students take exams in every course and have the opportunity to evaluate their performance.

TEXTBOOK and OPTIONAL READING

Book [592]: ΓΕΩΡΓΙΚΗ ΓΕΝΕΤΙΚΗ, Ιωάννης Ν. Ξυνιάς Λεπτομέρειες (Details)
Book [32997976]: Γενετική, Hartwell Leland, Hood Leroy, Goldberg Michael, Reynolds Ann, Silver Lee Λεπτομέρειες (Details)
Book [12469325]: ΕΙΣΑΓΩΓΗ ΣΤΗ ΓΕΝΕΤΙΚΗ, ΑΛΑΧΙΩΤΗΣ ΣΤΑΜΑΤΗΣ Λεπτομέρειες (Details)

OVERVIEW

SCHOOL	AGRICULTURAL TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL	*Undergraduate*		
COURSE CODE	**205**	**SEMESTER**	2nd
COURSE TITLE	**AGRICULTURAL ECONOMY AND POLITICS**		

INDEPENDENT DIDACTIC ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS CREDITS**
Lectures and Practice Exercises	2+2	6

COURSE TYPE	General Knowledge
COURSE PREREQUISITES:	
Teaching and EXAMINATION LANGUAGE	Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO
COURSE WEB PAGE	http://www.eclass.teipel.gr/eclass2/courses/STEG115/

LEARNING OUTCOMES

The aim of the course is to enable students to understand the basic laws and principles governing an economy. The aim is for them to understand the concept of scarcity of means of production, the Main Economic Problem, present in all economies, as well as the main aim of every economic unit (person, business, organisation, state), i.e. benefit maximisation. Finally, all of the above are analysed as to the particular characteristics (physical, structural, economic) of the agricultural sector.

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

Understand the basic and critical characteristics of production means and their connection to more general economic and operational objectives, and to the principles of each production unit.

Distinguish the basic economic laws and the way in which they affect the decisions of producers and consumers.

Understand the way in which policy related decisions affect real economy, as well as their necessity.

Cooperate with fellow students in analysing specific agricultural policy measures and the way in which they affect the decisions of producers and consumers.

General Competencies

Decision-making

Independent Work
Team Work
Project Planning and Management
Exercising judgement and self-refection
Promotion of free, creative and inductive thought

COURSE CONTENT

Basic economic concepts
Production possibilities curve / Selection Index / Isoquant Curve / Isocost line
Opportunity Cost
Production coefficients and production process
Law of Diminishing Returns
Demand / Offer of goods
Price formation / Price and quantity equilibrium
Short-term cost formation
Long-term cost formation
Specific characteristics of the agricultural sector (physical, structural, economic).
The issue of agriculture and the weaknesses of the price mechanism in the agricultural sector.
Agricultural policy measures (agricultural income support measures).
Structural policy (measures, philosophy, strategy).
The framework of the Common Agricultural Policy (CAP).
The comparative position of Greece in relation to the agricultural fundamentals of the E.U.
CAP application and reform.
Common Market Organisations
Development of agricultural policy in Greece, in the past fifty years.

TEACHING and LEARNING METHODS - ASSESSMENT

INSTRUCTION METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The learning process is supported through the e-class electronic platform
TEACHING ORGANISATION	

Activity	***Semester workload***
Lectures	29
Practice Exercises	29
Team Work on Case Study	20

	Independent Study	78
	Course Total (25 hours of workload per ECTS credit)	***156***
STUDENT ASSESSMENT	I. Written examination (80%) including: - Multiple choice questions - Short answer questions - Problem solving II. Group Assignment Presentation (20%)	

RECOMMENDED READING

-Suggested Reading: *-Related Scientific Journals:*

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	*Agricultural Technology*		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	*206*	*SEMESTER*	2nd Spring
COURSE TITLE:	**SYSTEMATIC BOTANY – WEED SCIENCE**		
TEACHING METHODS:	*TEACHING HOURS (WEEKLY)*	ECTS CREDITS	
Lectures and Recitations	2+2=4	4	
COURSE TYPE:	Special Infrastructure Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG142/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The purpose of the course is to enable students to identify and classify systematically cultivated or naturally grown plants which are of special agricultural interest in Greece. Also the course aims to equip students with the necessary knowledge to: Identify the main species of weeds, which compete with cultivated plants Evaluate their qualitative and quantitative effects on production Evaluate their contribution to diseases and plant pests Assess the need to intervene with weed control measures Design prevention programmes taking into consideration environmental factors Description of the course: The binomial nomenclature of naming organisms Levels of classification in organisms Systematic classification of plant species Description of characteristic features and properties of seed-grown plants of agricultural interest in Greece Also the course aims to equip student with the necessary knowledge to: Identify the main species of weeds, which compete with cultivation plants Evaluate their qualitative and quantitative effects on production Evaluate their contribution to diseases and plant pests Assess the need to intervene with weed control measures Design prevention programmes taking into consideration environmental factors
Competencies
Decision-making Working individually Team working

Promotion of free, creative and inductive thinking

COURSE TOPICS and SCHEDULE

Unit 1: Introduction to Systematics

Morphological characteristics (root, Shoot, Leaves, Flowers, Floral type)

Unit 2: Plant's Families

Ranunculaceae, Fumariaceae, Papaveraceae, Platanaceae Moraceae, Urticaceae, Juglandaceae, Fagaceae Amaranthaceae, Cactaceae, Caryophyllaceae, Chenopodiaceae, Portulacaceae Polygonaceae, Malvaceae, Cucurbitaceae, Brassicaceae Crassulaceae, Rosaceae, Fabaceae, Euphorbiaceae,Vitaceae Rutaceae, Zygophyllaceae, Geraniaceae, Oxalidaceae Apiaceae, Convolvulaceae, Cuscutaceae, Solanaceae, Lamiaceae Oleaceae, Orobanchaceae, Rubiaceae, Asteraceae, Cichoriaceae Cyperaceae, Poaceae, Liliaceae.

TEACHING AND LEARNING METHODS - ASSESSMENT

<table>
<tr><td>TEACHING METHOD</td><td colspan="2">In class</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td colspan="2">The teaching and learning process is supported by the electronic platform of e-class</td></tr>
<tr><td rowspan="4">METHODS OF INSTRUCTION</td><td>Method</td><td>Semester workload</td></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>In laboratories exercises that supplement lectures, the instructor reviews the lecture, expands on the concepts, carries on discussions with the students, and students in small groups apply the characteristics of plant identification and taxonomy.</td><td>26</td></tr>
<tr><td>Shelf-study</td><td>52</td></tr>
<tr><td>Total workload in hours</td><td>104</td></tr>
<tr><td>STUDENT LEARNING ASSESSMENT</td><td colspan="2">Language of Assessment: Greek, English (ERASMUS)
Method of Assessment:
Written term exam that includes:
- Multiple choice questions
- Short answer questions
- Important plants' identification
- Preparing a plant collection</td></tr>
</table>

TEXTBOOK and OPTIONAL READING

Suggested Literature

Aichele, D. & R., H. W. & A. Schwegler, 1993. Wild Flowers of Britain and Europe.

Balick, M.J. and P.A. Cox, 1997. Plants, People and Culture: The Science of Ethnobotany. New York: Scientific American Library.

Varthavakis M., 1993. Systematic Botany: Cryptogams – Seed-grown (3rd edition). Thessaloniki: Salonikidis Publ.

Bauman, H., W.T. Stearn and E.R. Stearn, 1993. Greek Wild Flowers and Plant Lore in

Ancient Greece. Great Britain: Her. Press
Briggs, D. and S.M. Walters, 1997. Plant Variation and Evolution (3rd edition). United Kingdom: Cambridge University Press
Bowman, H. And P. Brosalis, 1993. The Greek Flora in Legend, Art and Literature. Athens
Clason, W.E., 1989. Elsevier's Dictionary of Wild and Cultivated Plants in Latin, English, French, Spanish, Italian, Dutch and German. Amsterdam: Elsevier.
Emmanouel, A. And T. Papoulias, 1998. Complete Guide of Herbs: Treatment – Diet – Cosmetics – Cultivation. Athens
Foitos, D. G., 1984. Systematic Botany: Cryptogams – Seed-grown. Patra: Lychnos.
Gennadios, P.G., 1914. Plant Dictionary. Athens: Trohalia
Johnson, H. And D. Taylor, 1993. The International Book of Trees. London: Mit. Bea.
Keltemlidis, D.T. and T. Papoulias. Pharmaceutical Mushrooms and their Healing Uses. Athens.
Klein, R.M., 1987 The Green Word: An Introduction to Plants and People (2nd edition). USA: Harper Collins Publishers.
Polunin, O. And A. Huxley, 1987. Flowers of the Mediterranean. London: Chatto & Windus.
Press, B. and B. Gibbons, 1996. Trees of Britain and Ireland. London: Glasgow: Har. Col.
Sfikas, G., 1983. Trees and Shrubs of Greece. Athens.
Sfikas, G., 1994. Wild Flowers of Greece. Athens.
Strid, A. and E. Economidou, 1980. The Plants of Olympus. Athens
Subrahmanyam, N.S. 1996. Laboratory Manual of Plant Taxonomy. New Delhi.
Sugden, A., 1984. Longman Botany Handbook. Longman York Press.
Warner, D., D. Hosking and J. Hosking, 1995. Trees. Italy: Har. Col.

OVERVIEW

SCHOOL:	School of Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	301	**SEMESTER**	3d Fall
COURSE TITLE:	**PLANT NUTRITION- FERTILIZATION**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Recitations	3+2=5	6	
COURSE TYPE:	Scientific Area		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG125/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The focus of this course is to give students a greater understanding of the influence of mineral nutrients to the productivity of plants. The course examines the factors that determine the availability of mineral nutrients in soil, their uptake and use by plants. The diagnosis of soil nutrient availability and plant nutrient stress will also be examined. The interaction of mineral nutrients with biotic and abiotic stresses and the role of plant mineral nutrition in human health will also be discussed.
Competencies
Autonomous working Collaborative working Critical thinking and problem solving skills with respect to crop nutrition and fertilization.

COURSE TOPICS and SCHEDULE

Some of the topics that will be discussed are:

- Plant growth and Nutrient elements
- Elements essential for plant growth
- Forms of nutrients taken-up by plants
- Absorption of nutrients by plants
- Sources of nutrients in soils (organic matter and soil minerals)
- Fertilizers (N, P, & K fertilizers, secondary, and micronutrients - Fertilizer calculations)
- Organic amendments (Animal waste, Compost)

Course Learning Outcomes

- Acquire knowledge and understanding of the chemical processes in soils that influence mineral nutrient availability.
- Understand the role of mineral nutrients in the quality and the quantity of the harvested product.
- Develop an understanding of how mineral nutrients interact with important

abiotic and biotic stresses (salinity, drought, high acidity etc).
Develop an understanding of how the nutrient status of plants is diagnosed by soil and plant analysis.
Acquire knowledge of fertilizers and the general principles of their use, the importance of their formulation to soil nutrient availability and their impact to human health and environment.
Develop skills in sampling soil and plant tissues for routine analysis and diagnosis of nutrient status.
Develop skills in interpreting the results of soil and plant analyses.
Identification of nutrient disorders of plants will be made available.

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	39
Laboratory exercises	26
Shelf-study	78
Total workload in hours	***143***

STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Written term exam that includes: - Multiple choice questions - Short answer questions

TEXTBOOK and OPTIONAL READING

1. Marschner, H. (2012). Marschner's Mineral Nutrition of Higher Plants. (3rd ed) Academic Press, London.
2. Mengel, K. and Kirkby, E.A. (2001). Principles of Plant Nutrition, 5th edn. Int. Potash Inst., Bern, Switzerland.
3. Reuter D R and Robinson J. B (1997) Plant analysis: an interpretation manual (2nd edition). CSIRO Publishing
4. Bennet, W. 1993. Nutrient Deficiencies & Toxicities in Crop Plants. APS Press. Minnesota, USA.

OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY AND TECHNOLOGY OF FOOD AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	Undergraduate		
COURSE CODE:	302	**SEMESTER**	3
COURSE TITLE:	**AGRICULTURAL ENTOMOLOGY - ZOOLOGY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Recitations	3THEORY+2LABS=5h/WEEK	6	
COURSE TYPE:	Special Infrastructure Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/MHWUM131/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
This is a basic course, introducing students to the meaning of Agricultural Entomology and Zoology which is part of Plant Protection. It aims to introduce students the basic meaning of morphology, systematic and biology of harmful organisms of cultivated plants, (insects, mites, nematodes, mollusks, mammals, birds). It introduces students the main means and methods of pest control applied on cultivated plants infested by harmful insects and other animals. Main target of the course is to make students able to comprehend, evaluate and choose the most appropriate and effective means and methods, to control efficiently a pest in cultivation. By the completion of the course, the student will be able to: Classify the harmful insects and other animals of cultivations, in Orders and Families. Learn their morphological, biological and ecological characteristics, so as to choose the appropriate method for their control. Comprehend the influence of the environmental factors on the development of their populations. Recognize the natural enemies of the above mentioned harmful animals, on which their biological control is based. Learn the controlling methods of several insect pests on cultivated plants. Choose the most appropriate methods to control insect pests in the frame of Integrated Pest Management.
Competencies
Decision-making for evaluating and applying the most effective and economic methods for controlling insect pests, to avoid harmful effects to the environment. Autonomous working in the field and in the laboratory.

Collaborative working with the farmers and other colleagues for applying an effective plant protection program in the cultivation.
Advancement of a way of thinking with respect to the environment, farmers and consumers.

COURSE TOPICS and SCHEDULE

Insect morphology.
Insect systematic.
Insect anatomy, insect physiology.
Insect biology, insect ecology.
Insect pest management.
Mites
Nematodes
Other animals (insects, mites, nematodes, molluscs, mammals, birds).

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	Lectures for the theoretical session. Practice session in laboratory: Insect Identification, recognition of insect pests' symptoms.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class, internet, insect preparations and permanent slides, insect collection, insect observation under stereoscope and microscope.
METHODS OF INSTRUCTION	
STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Theory: Written final exam that includes short answer questions. Laboratory: Oral exam in each laboratory exercise.

Method	***Semester workload***
Lectures (Theory)	39
Practice session in Laboratory	26
Shelf study	78
Total workload in hours	***143***

TEXTBOOK and OPTIONAL READING

Optional Reading:

Butler, E.A 1923. A biology of the British Hemiptera-Heteroptera. Witherby G. H.F London.
Carter, W.1962. Insects in relation to plant disease. Interscience Publs, New York.
Della Beffa G. 1962. Agricultural Entomology. (In Greek) Translation by Karamanou G.J. & Marselou S. Vol 1 & 2. Editions: Giourdas, Athens.
Dodenheimer F.S and E.Swirski 1957. The Aphidoidea of the middle East. Weizmann Sci. Press. Jerusalem
Hill, D. (1979). Agricultural Insect Pests of the Tropica and their control. Cambridge University Press, Cambridge, U.K.

Stathas, G.J., 2000. Rhyzobius lophanthae Prey consumption and Fecundity. Phytoparasitica, 28 (3) : 203-211.

Stathas, G.J., 2000. The effect of temperature on the development of the predator *Rhyzobius lophanthae* and its phenology in Geece. *BioControl*, 45: 439-451.

Stathas, G.J., Eliopoulos, P.A., Kontodimas, D.C. and Giannopapas, J., 2001. Parameters of reproductive activity in females of *Harmonia axyridis* (Coleoptera : Coccinellidae). *European Journal of Entomology*, 98 (4): 547-549.

Stathas. G.J., Eliopoulos P.A., Kontodimas, D.C. and Siamos D. Th, 2002. Adult morphology and life cycle under constant temperetures of the predator *Rhyzobius lophanthae* Blaisdell (Col., Coccinellidae). Anzeiger für Schädlingskunde (*Journal of Pest Science*), 75: 105-109.

Veerman, A.1991. The Acari reproduction, development and life-history strategies. Chapman &Hall. London.

GENERAL

SCHOOL	AGRICULTURAL TECHNOLOGY & FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT	AGRICULTURAL TECHNOLOGY		
EDUCATION LEVEL	Undergraduate		
COURSE CODE	**303**	**SEMESTER**	AUTUMN 3rd
COURSE TITLE	**PLANT PATHOLOGY**		

COURSE COMPONENTS	**WEEKLY LECTURE HOURS**	**CREDITS**
Theory	2	
Laboratory Work	2	
Total	4	4.5

TYPE OF COURSE:	General Foundation Course
PREREQUISITES:	None
TEACHING and ASSESSMENT EXAMINATION LANGUAGE:	Greek Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes (in English)
ONLINE COURSE PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG115/

SKILLS DEVELOPMENT

Course Description and Learning Objectives

The course aims to provide students with the necessary knowledge to distinguish the main causes and activities of plant pathogens by identifying the characteristic symptoms and signs of crop diseases.

Competencies

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

- Identify the main symptoms and signs of parasitic and symptoms non-parasitic diseases of plants
- Isolate plant pathogens from infected plants
- Prepare culture media and identify the most important plant pathogenic fungi under the microscope
- Evaluate the impact of the disease on the quality and quantity of the crop production
- Collect suitable samples from infected plants for laboratory examination and complete the relevant accompanying paperwork

COURSE TOPICS AND SCHEDULE

Theory

- The concept of disease in plant pathology and agricultural practice
- Nutritional interactions between microorganisms and higher plants
- Symptoms of parasitic and non-parasitic diseases
- Taxonomy, morphology and physiology of the main classes of plant

pathogens (fungi, bacteria, phytoplasmas, rickettsia, viruses) and parasitic plants
- Pathogenesis (infection, defense mechanisms, plant tolerance)
- Epidemiology (conditions, disease onset, disease cycle, estimation of disease progression, epidemics)
- Non-parasitic diseases (nutrient deficiencies, toxicities)
- Diagnostic methods of plant parasitic diseases

Laboratory Work
- Terminology, description and distinction of plant disease symptoms
- Preparation of artificial culture media for plant pathogenic fungi and bacteria
- Preparation and observation of plant pathogenic fungus specimens under the microscope
- Identification of the morphological characteristics of the most important plant pathogenic fungi
- Disease diagnosis practice
- Visits to crop fields for the on-site identification of plant diseases and collection of samples

TEACHING and LEARNING METHODS - ASSESSMENT

TEACHING MODE	Theory: auditorium lectures for all students. Laboratory Work: laboratory exercises for students in small groups.
USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Audiovisual teaching methods, teaching support through e-class learning platform
COURSE STRUCTURE	***COMPONENT*** | ***Semester Workload*** Theory | 26 Laboratory | 26 Study | 52 ***Course Total*** | ***104***
STUDENT ASSESSMENT	Greek (English) Theory: final written multiple choice or essay examination (100% of final grade) Laboratory Work: final written examination including multiple choice (60% of final grade) and problem solving questions (40% of final grade)

RECOMMENDED READING

- Agrios, N. G., Plant Pathology, Elsevier Academic Press. Fifth Edition, 2005
- Watanabe, T. Pictorial Atlas of Soil and Seed Fungi: Morphologies of Cultured Fungi and Key to Species, CRC Press. Second Edition, 2002
- Webster J., Weber R., Introduction to Fungi. Cambridge University Press. Third edition, 2007

OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	304	**SEMESTER**	3ο
COURSE TITLE:	**GENERAL AGRICULTURE**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratory Exercises	2+2=4	4,5	
COURSE TYPE:	Special Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives

The course aims to familiarize the students with (1) the basic principles and the development of agriculture in the world and in Greece, (2) the anatomy, morphology and physiology of the main crops cultivated on a large scale (field crops), (3) the biotic and abiotic factors affecting agricultural production and the interactions between these factors and the plants, (4) the human interventions to increase agricultural production, improve the quality of agricultural production and protect the environment, the farmers and the consumers.

Upon successful completion of this course, students will be able to demonstrate an understanding of: (1) the basic facts of the main cultivated plants, especially plants cultivated on a large scale (field crops), (2) the factors that influence agricultural production and the counter-effects among these factors and agricultural plants, (3) the possibilities and ways of intervening with agricultural production in general.

At the end of the course, the optimally-successful student should be able to:

recognize the seeds and the propagating material of the major field crops,
recognize the important (for Greece) field crops at different stages of plant development,
apply methods for the evaluation of seed quality,
understand the effect of cultivation techniques in plant growth and yield of field crops,
choose - apply in each case the appropriate cropping system,
implement cultural practices that contribute to environmental protection,
understand the effect of postharvest handling on storage of field crops products.

Competencies

Adapt to new situations
Decision making
Autonomous working

Team working
Work in an interdisciplinary environment
Respect to the natural environment
Work in an international environment
Develop new research ideas

COURSE TOPICS and SCHEDULE

1. Contribution of agriculture to the human diet; the most important crops in the world and in Greece.
2. Criteria for classification of plants in categories; anatomical and morphological characteristics of the plants grown on a large scale (field crops).
3. Basic principles of plant growth and yield (applied physiology) of field crops.
4, 5. Effect of climatic factors (light, temperature, atmospheric precipitation, wind, CO_2 concentration) on the development of plants in the field and on crop yield.
6. Effect of soil (physical characteristics, biotic factors, symbiotic microorganisms) on plant growth in the field and on crop yield.
7. Effect of mineral nutrition on plant growth and on crop yield.
8. Interventions in soil (treatment, irrigation, fertilization) - a short statement on machines suitable for tillage, irrigation, fertilization.
9. Propagating material (seeds, vegetative propagating organs), sowing-planting a crop - a short statement on seed-planting machines.
10. Cropping systems (monoculture, intercropping, crop rotation, etc.), forms of agriculture activity (conventional, integrated, organic-biological), new technologies and culture techniques environmentally friendly.
11. Products of the major field crops, quality characteristics of the products.
12. Collection-harvest of field crops and post harvest handling of the products of the most important field crops - a short statement on harvest machines.
13. Brief presentation of the important (for Greece) field crops and the alternative crops with economic value for Greece (aromatic-pharmaceutical, energy plants, endemic plant species, plants of tropical origin, etc.).

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class and in laboratory, open field and greenhouse
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	26
Laboratory Exercises	26
Shelf-study	52
Total workload in hours	***104***

STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: I. Theoretical part of the course:

	Written term exam that includes development, short answer multiple choice questions or/and coursework. II. Laboratory part of the course: Written examination or laboratory work at the end of a laboratory exercise or a group of laboratory exercises.

TEXTBOOK and OPTIONAL READING

OPTIONAL READING

Acquaah G. (2002). Principles of Crop Production: theory, techniques and technology. Prentice Hall, New Jersey.

Bewley J.D. and Black M. (1994). Seeds: Physiology of Development and Germination. Plenum Press, N.Y.

Ehleringer J.R, Mooney H.A., Rundel P.W. and Pearcy R.W. (1992). Plant Physiological Ecology. Chapman & Hall, London.

Evans L.T. (1996). Crop Evolution, Adaptation and Yield. Cambridge University Press.

Fageria F.K., Baligar V.C. and Jones C.A. (1997). Growth and Mineral Nutrition of Field Crops. Marcel Dekker, Inc. N.Y.

Hanson, A.A. (1990). Practical Handbook of Agricultural Science. CRC Press, Boca Raton, Florida.

Hatfield J.L. and Steward B.A. (1994). Crops Residue Management. Lewis Publishers, Boca Raton, Florida.

Havlin J.L., Beaton J.D., Tisdale S.L. and Nelson W.L. (1993). Soil Fertility and Fertilizers - An introduction to nutrient management. Prentice Hall, New Jersey.

ISTA (1999). Seed Science and Technology. International Rules for Seed Testing.

Marschner H. (1995). Mineral Nutrition of Higher Plants. Academic Press.

Marshall T.J., Holmes J.W. and Rose C.W. (1996). Soil Physics. Cambridge University Press.

Martin H.J., Leonard W.H., Stamp D.L. and Waldren R.P. (2005). Principles of Field Crop Production. Prentice Hall, New Jersey.

Nobel P.S. (1991). Physicochemical and Environmental Plant Physiology. Academic Press, N.Y.

Nosberger J., Geiger H.H. and Struik P.C. (2001). Crop Science: progress and prospects. CABI Publishing, UK.

Pratley J. (1994). Principles of Field Crop Production. Oxford University Press, N.Y.

Taiz L. and Zeiger E. (2006). Plant Physiology. Sinauer Associates.

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	305	**SEMESTER**	3rd
COURSE TITLE:	**GENERAL ARBORICULTURE**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratory	2+2=4	4,5	
COURSE TYPE:	Special Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course provides the students with the basic knowledge required for the cultivation of the crop trees which are adapted to the Greek climate, in order to maximize fruit yields and fruit quality. Upon the successful completion of this course, students will be able to demonstrate an understanding of: •Recognizing the different kind of crop trees. •Recognizing the various parts of a tree (roots, stems, leaves, bud types, flower types, etc.) •The basic concepts of tree production (bud formation, flower fertilization, propagation, pruning, dormancy, crop thinning, tree planting etc.). •Planting a tree in the right position. •Choosing the right rootstock according to the chosen variety. •Develop procedures to manage soils for improved tree growth. •Develop procedures for managing health disorders of the trees, including environmental, pest and disease problems. •Determine appropriate water management procedures for healthy tree growth. •Understand commonly used plant propagation and tree grafting techniques.
Competencies
Decision-making Working individually Team working

COURSE TOPICS and SCHEDULE

• Defining trees cultivated for fruit and nut production. • Parts of the tree (types of branches, buds, rootstocks, scions, fruit habits of each species, fruit bearing shoots, types of blossom etc.).

• How to recognize the various species of trees.
•Morphology -kind of fruit crops.
• Importance of fruits and nuts-their nutritional benefits.
• World statistics in fruit tree and nut production.
•The cultivation of fruit trees and nuts in Greece (economic importance, areas of cultivation, production etc.)
• Classification of tree crops (pomological, botanical, climatic).
•Propagation techniques -sexual and asexual propagation.
• How to select the location of an orchard.
• Chilling and heat requirements of tree crops.
• Familiarizing students with fruit trees in terms of their adaptability in different soil-climatic environments.
• How frost affects fruit trees- protection techniques against frost.
• Various cultivation techniques (pruning, irrigation, transplanting, grafting techniques, fruit thinning, fruit maturity criteria etc.)
• Planting systems.
• Rootstocks (why trees are grafted on rootstocks, kinds of rootstocks etc.)
• Harvesting methods of tree crops.

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class and by visiting fields where crop trees are cultivated.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload*** Lectures: 26 Laboratory: 26 Shelf study: 52 ***Total workload in hours***: ***104***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Methods of assessment: The theoretical part by written exam, the practical part orally and by written exam.

TEXTBOOK and OPTIONAL READING

Suggested Literature:

•Hampson, C., Kemp, H. 2003. Characteristics of important commercial apple cultivars. In: Apples. Botany, production and uses. (D. Ferree, I.Warrington, eds.). p. 61-91. CABI publishing. London.
•Petridis A., Kokkouricou Magdalene, Sotiropoulos Th., Stylianidis D.2010. Antioxidant activity of fruits produced in North Greece. Hortscience 45 (9) 1341–1344.
•Tous J., A. Romero, J. PLana, X. Sentis and J. Ferrán, 2004. Effect of nitrogen, boron and iron fertilization on yield and nut quality of ´Negret´ hazelnut trees. Acta Hort. 686: 271-280.

OVERVIEW

SCHOOL:	Agricultural Technology & Food Technology and Nutrition		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	306	**SEMESTER**	3nd
COURSE TITLE:	**PLANT BREEDING**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Practical Courses	2+2=4	4.5	
COURSE TYPE:	Agricultural Science		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG123/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The certain courses objective is give to students the opportunity to learn plant crosses and general selection methods. Different selection methods are needed to isolate plant lines exhibiting tolerance to biotic and abiotic stress conditions or to increase agricultural plant yield. The students also learn for genetic marker assisted selection and molecular methods to characterize certain varieties. The biological principles of hybrids are study during the semester as well as the traditional varieties culture and improvement. At the end of theoretical and practical courses the students are able to understand how to improve different plant species. Furthermore, the students are able to design simple selection experiments and cross varieties in order to create productive hybrids.
Competencies
Plant Line Selection methods Biological basis of hybrids Genetic marker-assisted selections Improvement of plants in stress conditions

COURSE TOPICS and SCHEDULE

<u>Unit 1: Methods</u> 1. PCR basic 2. PCR based methods for plant breeding experiments 3. DNA recombination based methods 4. Plant breeding principles <u>Unit 2: Genetic basis</u> 5. Population Genetics 6. Basic selection rules I 7. Basic selection rules II

8. Heterosis
Unit 3: Plant breeding
9. How hybrids are constructed in different plant species
10. Improvement of plant tolerance in biotic and abiotic stress conditions
11. Transitionally cultivated plant varieties
12. Male sterility
13. Molecular plant breeding

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class- in laboratory and in the field
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload***
	Lectures: 26
	In the practical section in small group training courses the students have the opportunity to learn how to cross plants especially different tomato varieties, corn and wheat plants. The students setting up and an experimental field in order to select and improve wheat varieties: 26
	Shelf-study: 52
	Total workload in hours: ***104***
STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Optional Exams for the students during semester Written term exam that includes: - Multiple choice questions - Short answer questions In practical courses the students take exams in every course and have the opportunity to evaluate their performance.

TEXTBOOK and OPTIONAL READING

Book [33074459]: ΒΕΛΤΙΩΣΗ ΦΥΤΩΝ, Ιωάννης Ξυνιάς Λεπτομέρειες (Details)
Book [148677]: ΒΕΛΤΙΩΣΗ ΦΥΤΩΝ, Α. ΤΣΑΥΤΑΡΗΣ, ΕΙΡ. ΝΙΑΝΙΟΥ, Α.ΠΟΛΥΔΩΡΟΣ Λεπτομέρειες (Details)
Book [14492]: Γενετική Βελτίωση Φυτών, Φανουράκης Νικ. Λεπτομέρειες (Details)

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	Undergraduate		
COURSE CODE:	401	**SEMESTER**	4th Spring
COURSE TITLE:	**FLORICULTURE**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratories	3+2=5	5	
COURSE TYPE:	Special Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG135/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course aims to disseminate to students the basic concepts of Floriculture by transiting them the necessary knowledge on ornamental plant production and use. Upon completion of the course, the students will be able to: Classify ornamental plants (botanical classification) Be aware of the effects of the environmental and greenhouse conditions on the production of ornamental plants Adopt and apply the basic cultivation techniques Be aware of the sexual and the asexual propagation and be able to apply them in most efficient ways. • Learn the basic postharvest principles of storage, packing, transportation and trade of ornamental plants in local and/or international markets
Competencies
Decision-making Individual working Team working Development of new research ideas

COURSE TOPICS and SCHEDULE

<u>Lecturing modules</u> Object, perspectives and sectors of Floriculture Botanical classification and characteristics of ornamental plants Major factors of plant development (soil, temperature, humidity, light, CO_2) Ornamental plant cultivation techniques (planting containers, substrates, irrigation, fertilization, pruning, etc.) Sexual and asexual propagation of ornamental plants Specialized cultivation techniques (Flowering, hydroponics etc) Postharvest technology of ornamental plants

Marketing of ornamental plants

Laboratory and practical application:
Cultivation of ornamentals in different substrates, soil or hydroponic systems
Implementation of vegetative propagation
Calculation of fertilization base and surface lubrication
Implementation of key growing care (pruning, topping, irrigation, fertilization)
Growing floricultural species in outdoor and greenhouse (Pot plants)
Identification of ornamental plants

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class, in the laboratory and in the greenhouse
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Lecturing is strongly supported by the e-class learning platform
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	39
Laboratory work	26
Shelf-study	78
Total workload in hours	***143***

STUDENT LEARNING ASSESMENT	Assessment language: Greek, English (ERASMUS) Assessment method: Written term exam that includes: Multiple choice questions Short answer questions Identification of ornamental plants - Written assays

SUGGESTED LITERATURE

TEXTBOOK

Dole, J.M. and Wilkins, H.F., 2005. Floriculture. Principles and species. Prentice Hall, 2nd ed. IL, USA

OPTIONAL READING

Armitage, M.A., 1993. Bedding Plants. Ball Publishing. Batavia, IL, USA
Larson, R.A., 1992. Introduction to Floriculture. 2nd Edition, Academic Press, CA, USA.
Ingels, J.E., 2001. Ornamental Horticulture. Delmar Publishers Inc., USA.
Hamrick, D. 2003. Ball Redbook. Crop production. 17th ed. Ball Publishing , Batavia IL, USA

FIELD VEGETABLES

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	403	**SEMESTER**	4th (spring)
COURSE TITLE:	**PRECISION AGRICULTURE**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Practice	2+2=4	6	
COURSE TYPE:	General Infrastructure Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course objective is to introduce students to the various applications of the Computer and Telecommunication Sciences in Agriculture and make them familiar to concepts like: Precision Agriculture, Geographic Information Systems – GIS, Global Positioning System – GPS, Remote Sensing, Digital Maps, Statistical Analysis of Spatial Data, Spatial Data Analysis Techniques, Decision Making Upon successful completion of this course, students will be able to demonstrate an understanding of: The definition, the tools and processes of Precision Agriculture. The basics of a GIS. The basic digital Map principles. The basic statistical techniques for Spatial Data Analysis. The Spatial Data Structures. The basic Analysis and Manipulation Tools for Spatial Data. The basic Interpretive Techniques for Spatial Data Analysis. The Interpretive Maps. Basic Issues and Concerns about Precision Agriculture.
Competencies
Decision-making Autonomous working Collaborative working Advancement of a free, productive and inductive mind

COURSE TOPICS and SCHEDULE

Introduction
Definition of Precision Agriculture
Tools of Precision Agriculture
Processes of Precision Agriculture

Basics of a GIS
What Is a GIS?
GIS—The Software
Functions of a GIS
Examples of GIS Software
Basic Map Principles
Importance of Maps
Geodetic Concepts
Types of Maps
Basic Statistics
Importance of Mathematics in Agriculture
Statistical Terms
Statistical Techniques
Research
Data Structure
What Is a Data Format?
Vector Data
Raster Data
Vector or Raster Analysis
Analysis and Manipulation Tools
Data Manipulation
Table Analysis Tools
Vector Map Tools
Raster Analysis Tools
Interpretive Techniques
Histograms
Charts
Normalization
Reclassification
Neighborhood Statistics
Modeling
Interpretive Maps
What Is an Interpretive Map?
Suitability Maps
Temporal Analysis Maps
Net Profit Maps
Statistical Analysis
Modeling
Issues and Concerns
Variable Rate Application
Is It Research?

Trusting the Data
Use of Precision Agriculture
Efficiencies of Precision Agriculture
Large Farm vs. Small Farm

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	26
Practice (GIS LAB)	26
Shelf-study	74
Group Project	30
Total workload in hours	***156***

STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Computer Lab Practice or group Projects (20%) Written term exam that includes (80%): Multiple choice questions Short answer questions

TEXTBOOK and OPTIONAL READING

Basic Textbook:
Brase Terry (2005), "Precision Agriculture", 1st Edition, Delmar Cengage Learning, ISBN: 9781401881054.
Additional Reading Material:
Heywood I., Cornelius S. and Carver S. (2006), "An Introduction to Geographical Information Systems", 3rd edition, Pearson Education Limited.

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	Undergraduate		
COURSE CODE:	404	**SEMESTER**	4th Spring
COURSE TITLE:	**WATER RESOURCES MANAGEMENT- IRRIGATION - DRAINAGE**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratories	2+2=4	4	
COURSE TYPE:	Special Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG140/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course is an autonomous lesson of the Agricultural Science. The aim of the course is to leverage all the parameters taken into account for the selection of the proper irrigation system, and to create and implement an irrigation schedule, provided that the attendees have successfully fulfill their obligations according to the exams and the tests (see below). The knowledge acquired by the completion of their obligations, are of level 6 and they form the advanced knowledge in the field of work which in turn means critical understanding of the theory and the principles of irrigation. The individual targets of the lesson are: To evaluate the water quality To select and install the proper pumping system To evaluate a soil's / substrate's properties in relation to water To calculate the irrigation needs of a crop To develop an irrigation schedule by using CropWat 8 To develop a drainage network
Competencies
Decision making Working individually Team working Respect to the natural environment Be self-aware and use sound judgment Promotion of free, creative and inductive thinking

COURSE TOPICS and SCHEDULE

Lecturing modules Irrigation water quality Pumping of irrigation water Soil – water relations

Calculation of crop water needs
Irrigation scheduling
Irrigation water supply networks
Surface irrigation
Sprinkler irrigation
Drip irrigation
Subsurface irrigation
Drainage principles

Laboratory and practical application:

Water sampling and determination of the basic parameters of the irrigation water quality,
Pumps, pump types, connection types and pumping problems,
Soil moisture, determination, calculation and problems concerning soil moisture
Soil moisture curves and the parameters determined by using the curves
Infiltration calculations in the field
Calculation of Evapotranspiration by using CropWat 8
Calculation of crop water needs, dose, range and duration of irrigation, irrigation scheduling
Surface irrigation: kinds and examples of making surface irrigation
Sprinkler irrigation: Calculation of basic parameters
Drip irrigation: Calculation of basic parameters
The making of a drainage network

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class, in the laboratory and on the field
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Power point presentations during lectures and exercises; practice and self-assessment test on the Blackboard; Use of e-class.
METHODS OF INSTRUCTION	***Method*** / ***Semester workload***
	Lectures: 26
	Laboratory work: 26
	Shelf-study: 52
	Total workload in hours: ***104***
STUDENT LEARNING ASSESMENT	Assessment language: Greek, English (ERASMUS) Assessment method: The examination in Theory is comprised of Multiple Choice, Questions for Short Answers, and Written Exercises (via e-class). The written exercises, will count up to 20% of the final grade. Potentially, the examination can be oral, only in obligatory cases. The examination in Laboratory is comprised of Multiple Choice Questions, and Problem Solving. The evaluation of the students will take place after finishing each Learning Section. The final grade will be the average of the grades from each section.

	Potentially, the examination can be oral, only in obligatory cases.

SUGGESTED LITERATURE

TEXTBOOK

FAO: Irrigation Water Management: Training Manuals Nr. 1-11, Food Agricultural Organization

C.M. Burt, A Clemens, R. Bliesner, J.L. Merriam, L. Hardy, Selection of Irrigation Methods for Agriculture, American Society of Civil Engineers, 2000

OPTIONAL READING

H.W.,Belcher, Frank M.,D'Itri, Subirrigation and Controlled Drainage, Taylor & Francis Ltd, 1994

M. G.,Bos, M.A.S.,Burton, D. J.,Molden, Irrigation and Drainage Performance Assessment, 2005

Freddie R. Lamm, James E. Ayars, Francis S. Nakayama, Microirrigation for Crop Production, Elsevier, 2007

Larry W.,Mays Water Resource Systems Management Tools, McGraw-Hill Education - Europe, 2004

D. P. Loucks and Eelco van Bee, Water Resources Systems Planning and Management An Introduction to Methods, Models and Applications, United Nations Educational, Scientific and Cultural Organization, Paris and Delft Hydraulics, The Netherlands, 2005

Pete Melby, Simplified irrigation design 2nd edition, Wiley 1995

Leo M.L. Nollet, Handbook of Water Analysis, Taylor & Francis Ltd, 2000

B. A. Stewart and D. R. Nielsen, co-editors, Irrigation of agricultural crops No 30 in the series Agronomy, American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Madison, Wisconsin USA, 1990

http://www.fao.org/nr/water/docs/cropwat8.0example.pdf

AGRICULTURAL CONSTRUCTIONS

GENERAL

SCHOOL	Agricultural Technology & Food Technology and Nutrition		
ACADEMIC UNIT	Department of Agricultural Technology		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	406	**SEMESTER**	4th
COURSE TITLE	**FEASIBILITY ANALYSIS AND FARM ACCOUNTANCY**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Practice	2+2=4	6

COURSE TYPE	Specialised general knowledge (Administration, Economy, Legislation and Humanities Courses)
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)
COURSE WEBSITE (URL)	http://www.eclass.teipel.gr/eclass2/courses/ACRPR133/

LEARNING OUTCOMES

Learning outcomes
This course is the basic introductory course on the concepts of costing and agricultural accountancy. This course aims to introduce students to the basic concepts of agricultural factors of production and the cost of production system and contributes to the understanding of the configuration of the feasibility studies. Also analysed accounting for agricultural activities so the student must have an overall understanding of the configuration and updating of farm accounts and methodologies. In this sense the course is the basis on which specific methodologies and economic indicators of project analysis techniques allow students to assess their economic efficiency and the economic interest of all kinds of agricultural activities. Finally, the course objective is the understanding by students of the importance of project management in the modern economy and the evolution of cost analysis, farm accountancy and project monitoring in a distinct scientific field / profession.

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

- understand basic and critical features of costing, and the connection with broader economic and operational objectives and principles of accountancy.
- have knowledge of the tools and techniques of cost accounting and how it is used for the formation of the budget and evaluation of different cropping plans that a farmer could choose.
- know the basic methods of agricultural estimation, as well as the determination of the optimal production point.
- distinguish the main role of individual inputs in the implementation of a production system and therefore its budget.
- analyse and calculate the basic costs of the project and connect them with the project schedule.
- analyse and connect the economic indicators of agribusiness
- keep farm accounts

General Competences

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Adapting to new situations
- Working independently
- Team work
- Project planning and management

SYLLABUS

i. Basic concepts. Structures of feasibility studies. Elements of the theory of production costs
ii. The inputs and costing
iii. Findings of productive expenditure
iv. Agricultural evaluative
v. Exercises costing specific farming projects
vi. Economic Indicators
vii. Details Accounting - Inventories
viii. Accounting books
ix. The Farm Accountancy Data Network (FADN)
x. Exercises for entries in the forms of accountancy

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Learning support through the web based e-class platform
TEACHING METHODS	

Activity	***Semester workload***
Lectures	26
Practice	26

	Self-study	104
	Course total	***156***
STUDENT PERFORMANCE EVALUATION	Final examination that includes: i. One theoretical question (40% of credits) ii. One exercise on cost of farming with different subqueries (60% of credits)	

ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

Barbara M. Wheeling (2007) Introduction to Agricultural Accounting, Thomson Delmar Learning.
Charles Zawde (2007) Feasibility Study: Preparation and Analysis, Princeton Commercial Holdings.
David S. Clifton, David E. Fyffe (1977) Project feasibility analysis: a guide to profitable new ventures, the University of California Press.
Robert E. Stevens, Philip K. Sherwood (1982) How to prepare a feasibility study: a step-by-step guide including 3 model studies, Prentice-Hall.
Roger H. Juchau (1989) Agricultural Accounting: Perspectives and Issues, Accounting and Finance Unit, Lincoln University Press.
Αποστολόπουλος Κ. – Καλδής Π. (2010), «Αγροτική οικονομική Κόστος, οικονομικό αποτέλεσμα, ανταγωνιστικότητα» Εκδότης: Ελληνοεκδοτική
Ζιώγα Ν., Ντελή Δ., Σχορτσανίτη Κ. (1992), Κόστος Παραγωγής Αγροτικών Προϊόντων και Αποδοτικότητα της Ελληνικής Γεωργίας (1969-1989), Εκδ. Α.Τ.Ε., Π. Σπάθη (2000), Οικονομικά της Γεωργικής Παραγωγής, Εκδ. Στοχαστής, Αθήνα.
Καρβούνης Σ. (1993), Μεθοδολογία εκπονήσεως οικονομοτεχνικών μελετών, Εκδ. Σταμούλης, Αθήνα
Κιστοπανίδη Γ. (1990), «Οικονομική Γεωργικών Εκμεταλλεύσεων (Γεωργική Μικροοικονομία)», Εκδ. ΖΗΤΗ, Θεσσαλονίκη
Κιστοπανίδη Γ. (2007), «Γεωργική λογιστική και εκτιμητική. Αρχές και εφαρμογές». Εκδόσεις ΖΗΤΗ, ISBN: 9789604560554
Κιτσοπανίδης Γ. (1990), Οικονομική Γεωργικών Εκμεταλλεύσεων, Εκδ. ΖΗΤΗ, Θεσσαλονίκη
Μαρτίκα – Βακιρτζή Μ. & Δημητριάδου Ε. (2007), «Λογιστική Παρακολούθηση Τύπων Αγροτικών Εκμεταλλεύσεων», Εκδόσεις Γράφημα.
Μηλιώνη Ειρ. (1992), Οικονομοτεχνικές Μελέτες, Σύγχρονη Εκδοτική, Αθήνα
Τσουκαλάς Στ. (2010), «Λογιστική Επιχειρήσεων Τροφίμων και Γεωργίας», Εκδόσεις Στοχαστής, ISBN 978-960-303-180-2
Υπουργείο Γεωργίας, Δείκτες Ο.Δ.Γ.Ε. των περιφερειών της Ελλάδας.

OVERVIEW

SCHOOL:	*Agricultural Technology and Food Technology and Nutrition*		
DEPARTMENT:	*Agricultural Technology*		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	*501*	*SEMESTER*	*5th FALL*
COURSE TITLE:	**PRODUCTION OF PLANT PROPAGATING MATERIAL (VEGETATIVE PROPAGATION)**		
TEACHING METHODS:	*TEACHING HOURS (WEEKLY)*	*ECTS CREDITS*	
Lectures and Recitations	*3+2=5*	*6*	
COURSE TYPE:	*Special Infrastructure Course*		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG154/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The purpose of the course is to enable students to know practically and theoretically the methods of sexual and asexual propagation of plants. The students trained on techniques of plants propagation. Sexual propagation (seeds, seed dormancy seeds germination) of plants Asexual propagation of plants (propagation by cuttings, layering, grafting and budding, micropropagation).
Competencies
Decision-making Working individually Team working Promotion of free, creative and inductive thinking

COURSE TOPICS and SCHEDULE

Unit 1: Techniques of seed production Unit 2: Techniques of asexual propagation Cuttings Budding Micropropagation

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class

METHODS OF INSTRUCTION	***Method***	***Semester workload***
	Lectures	39
	In laboratories exercises that supplement lectures, the instructor reviews the lecture, expands on the concepts, carries on discussions with the students, and students in small groups apply the characteristics of plant recognition and taxonomy.	26
	Shelf-study	78
	Total workload in hours	***143***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Written term exam that includes: - Multiple choice questions - Short answer questions - working on plant propagation techniques	

TEXTBOOK and OPTIONAL READING

Suggested Literature

• Andersen, L., Bronnum, P. and Jensen, M. 1999. Influence of temporary covers on the growth of nursery tree seedlings. J.Hort. Sci. Biotech, 74:74-77

• Baker,H. 1999. Growing Fruit. The Royal Horticultural Society, London, England • Both W.H et al. 1987. Potato Growing. University of Idaho, College of Agriculture Extension Publication. • Burton W.G.1989. The potato

• George F.E. 1993. Plant Propagation by tissue culture ,2nd, the Technology Exegetics 53

• Guenther J.F et al. Mandatory seed laws and other Idaho seed potato issues. Current Information Series No 906.University of Idaho, College of Agriculture Extension Publication

• Harris P. 1992. The potato crop.

• Hartman et al. 1997. Plant propagation: principles and practices 6th Prentice Holl.

• Hartmann, H.T and Kester, D.E.1975. Plant Propagation. Principles and practices. Third Edition Prentice-Hall, Jnc. Englewood Cliffs.

• Hayward, Bosemark, N.O and Romagossa, J. 1993. Plant Breeding. Principles and prospects. Chapman Hall. London.

• Hutchins J.D et al. 1997. Seed health testing: progress towards the 21st century. CAB International

• ISTA, Seed Science and Technology. International Rules for Seed testing, 1999.

• Lower H. Peter.1975. Seeds and cuttings. N.Y Walker Kramer Jack. 1977. Starting Fram seed: drawings by Robert Johnson 1st, Ballantine Books.

• Lower H. Peter.1995. Seeds: the definitive guide to growing, history and lore. N.Y Macmillan

• Martin H.L et al. 1976. Principles of Field Crop Production, 3rd ,Macmillan Publishing

Co Inc. N.Y

- Pacific Northwest Extension Publications 1992. Potatoes: Influencing Seed Tuber Behavior. Pacific Northwest Cooperative Extension
- Pasquale, F.Giuffrida, S.and Carini, F. 1999. Minigratting of shoots, roots, inverted roots and somatic embryos for ressue of in vitro citrus regenerants. J.Am.Soc. Hort. Sci., 124(2):152-157.
- Struik,P.C et al. 1999. Seed Potato Technology. Wageningen Pers.Jan 1999.
- Thorpe, T.A 1978. Plant Tissue Culture. Methods and applications in Agriculture. Academic Press, Inc. New York, Toronto, London, Tokyo.

GENERAL

SCHOOL	AGRICULTURAL TECHNOLOGY & FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT	AGRICULTURAL TECHNOLOGY		
EDUCATION LEVEL	Undergraduate		
COURSE CODE	**502**	**SEMESTER**	AUTUMN - 5th
COURSE TITLE	**PLANT PROTECTION PRODUCTS**		

COURSE COMPONENTS	**WEEKLY LECTURE HOURS**	**CREDITS**
Theory	3	
Laboratory Work	2	
Total	5	6.0

TYPE OF COURSE:	Specialization Course
PREREQUISITES:	None
TEACHING AND ASSESSMENT EXAMINATION LANGUAGEGE:	Greek Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes (in English)
ONLINE COURSE PAGE (URL)	http://www.eclass.teipel.gr/eclass2/modules/document/?course=TTG114

SKILLS DEVELOPMENT

Course Description and Learning Objectives
The course aims to provide students with the necessary knowledge to apply plant protection products effectively and safely for both producers and consumers of agricultural products and to ensure that these products have the least possible impact on the environment.
Competencies
Upon successful completion of this course, students will be able to: • Identify the basic properties of the main categories of plant protection products • Evaluate and select the most suitable plant protection product on a case-by-case basis • Design and apply integrated pest management programs • Manage or operate a plant protection product business

COURSE TOPICS AND SCHEDULE

Theory • General characteristics and properties of plant protection products

- Classification and chemical classes of plant protection products
- Selection criteria for the appropriate plant protection product based on efficacy and safety for humans and the environment
- Risk assessment and management of plant protection products
- Management of the development of pesticide resistance problems

Laboratory Work

- Pesticide application methods
- Application of safety measures
- Preparation and application of pesticide formulations
- Safety management of pesticides
- Design of integrated pest control management programs

TEACHING and LEARNING METHODS - ASSESSMENT

TEACHING MODE	Theory: auditorium lectures for all students. Laboratory Work: laboratory exercises for students in small groups.
USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Audiovisual teaching methods, teaching support through the e-class learning platform
COURSE STRUCTURE	

COMPONENT	***Semester Workload***
Theory	39
Laboratory	26
Study	78
Course Total	***143***

STUDENT ASSESSMENT	Greek (English) Theory: final written multiple choice or essay examination (100% of final grade) Laboratory Work: final written examination including multiple choice (60% of final grade) and problem solving questions (40% of final grade)

RECOMMENDED READING

- Lecture Notes

VEGETABLES UNDER SHELTER

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	Undergraduate		
COURSE CODE:	504	**SEMESTER**	5th fall
COURSE TITLE:	**PRODUCTIVE FLORICULTURE**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratories	3+2=5	6	
COURSE TYPE:	Special Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/ABGRFL125/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course aims to disseminate to students the basic concepts of Floriculture by transiting them the necessary knowledge on ornamental plant production and use. Upon completion of the course, the students will be able to: • Classify ornamental plants (botanical classification) • Be aware of the effects of the environmental and greenhouse conditions on the production of ornamental plants • Adopt and apply the basic cultivation techniques • Be aware of the sexual and the asexual propagation and be able to apply them in most efficient ways. • Learn the basic postharvest principles of storage, packing, transportation and trade of ornamental plants in local and/or international markets
Competencies
Decision-making Individual working Team working Development of new research ideas

COURSE TOPICS and SCHEDULE

Lecture modules:

Effect of factors affecting production (I.e. temperature, sunlight, CO_2, humidity, soil, soil substrates)
Greenhouse systems and regulation of plant growth environment
Basic principles of cultivation (soil disinfestation, planting, fertilization, irrigation, other treatments)
Hydroponic cultivation for the production of cut flowers
Propagation (sexual and asexual

Postharvest physiology (respiration, transpiration, ethylene, water potential, vascular occlusion etc.)
Postharvest technology (refrigeration-servicing, maintenance solutions, packing, transportation, etc.)
Domestic and international markets and trade of cut flowers and ornamental plants

Laboratory and practical application:

Students are trained to apply in practice (i.e. productive cultivation) of rose, carnation, freesia, gerbera, lilies, anemone, sansevieria, geranium, impatiens, begonias etc.
Amplification methods of the above plants and practice
Calculate the nutrient supplementation Learn to recognize floricultural plants, indoor plants and cut flowers

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class, in the laboratory and greenhouses
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Lecturing is strongly supported by the e-class learning platform
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	39
Laboratory work	26
Shelf-study	78
Total workload in hours	***143***

STUDENT LEARNING ASSESMENT	Assessment language: Greek, English (ERASMUS) Assessment method: Written term exam that includes: - Multiple choice questions - Short answer questions - Identification of ornamental plants - Written assays

SUGGESTED LITERATURE

TEXTBOOKS

Hamrick, D. 2003. Ball Redbook. Crop production. 17th ed. Ball Publishing , Batavia IL, USA
Armitage, A.M. and Lauhsman J.M., 2003. Specialty Cut Flowers: The Production of Annuals, Perennials, Bulbs and Woody Plants for Fresh and Dried Cut Flowers. Timber Press, USA.

OPTIONAL READING

Larson, R.A., 1992. Introduction to Floriculture. 2nd Edition, Academic Press, CA, USA.

Boodley, J.W., 1998. The Commercial Greenhouse. 2nd Edition, Delmar Publishers, USA.

Dole, J.M. and Wilkins, H.F., 2005. Floriculture. Principles and species. Prentice Hall, 2nd ed. IL, USA.

Ingels, J.E., 2001. Ornamental Horticulture. Delmar Publishers Inc., USA.

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	505	**SEMESTER**	5th
COURSE TITLE:	**PERENNIAL CROP TREES**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratory	3 Lect.+2Lab.=5 hours/week	6	
COURSE TYPE:	Specialization course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
Acquisition of specialized knowledge on the cultivation of the following species of tree crops: •Olive tree (for oil and for table olives). •Citrus trees (orange, lemon, mandarin, grapefruit, kumquat, bitter orange, bergamot orange, citron, lime). •Avocado. •Loquat tree.
Competencies
Decision making Collaborative working Autonomous working

COURSE TOPICS and SCHEDULE

For each of the above species is analyzed:
•Botanical classification.
•Origin. History of cultivation.
•The expansion of the cultivation in Greece and abroad.
•Climatic requirements (temperature, atmospheric humidity, rain etc.)
•Methods used to protect the trees from bad climatic conditions such as frost, high air-humidity etc.
•Soil requirements according to the rootstock on which each variety is grafted.
•Soil management-weed control.
•Pruning-thinning the fruits (proper time-methods and techniques).
•Grafting-planting a new orchard.

•Pollination requirements (self fertile, no self fertile varieties, parthenocarpic varieties).
•Productivity.
•Nutrient demands.
•Fruit maturation (criteria used).
•Harvesting methods-time of harvest.

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	Lectures with PowerPoint and video, and excursions to olive and citrus orchards.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload***
	Lectures: 39
	Laboratory: 26
	Shelf-study: 78
	Total workload in hours: ***143***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Method of assessment: Written exam for the theoretical part. Written and oral exam for the laboratory.

TEXTBOOK and OPTIONAL READING

Gucci, Ricardo & Cantini Claudio, (English) *Pruning and Training systems for modern olive growing.* CSIRO Publishing, Australia. 2000

OVERVIEW

SCHOOL:	*Agricultural Technology and Food Technology and Nutrition*		
DEPARTMENT:	*Agricultural Technology*		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	*601*	*SEMESTER*	*6th Spring*
COURSE TITLE:	**ORNAMENTAL PLANTS - LANDSCAPE ARCHITECTURE**		
TEACHING METHODS:	*TEACHING HOURS (WEEKLY)*	*ECTS CREDITS*	
Lectures and Recitations	*3+2=5*	*6*	
COURSE TYPE:	*Special Infrastructure Course*		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG163/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The purpose of the course is to enable students to know practically and theoretically the principles of Garden designing and Landscape architecture. Also the students will be able to identify the main ornamental plants.
Competencies
Decision-making Working individually Team working Promotion of free, creative and inductive thinking

COURSE TOPICS and SCHEDULE

Unit 1: Garden design and Landscape architecture Unit 2: Identification of major ornamental plants

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class	
METHODS OF INSTRUCTION	***Method***	***Semester workload***
	Lectures	39
	In laboratories, exercises that supplement lectures, the instructor reviews the lecture, expands on the concepts, carries on discussions with the students, and students in small	26

	groups apply the characteristics of plant identification and taxonomy.	
	Shelf-study	78
	Total workload in hours	***143***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Written term exam that includes: - Multiple choice questions - Short answer questions - working on plant propagation techniques	

SUGGESTED LITERATURE

Noailles Le Vicompte and Loncaster Roy, 2003. Mediterranean Plants and Gardens. Burall Flora Print Ltd. UK.

Rees, Y., and Paliser D., 1996. Conservatory Gardening: Creating an Indoor Garden, Wiltshire. 62

Rusforth, K., 1990. Tree Planting and Management. David and Charles Newton Abbot, London.66

GENERAL

SCHOOL	AGRICULTURAL TECHNOLOGY & FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT	AGRICULTURAL TECHNOLOGY		
EDUCATION LEVEL	Undergraduate		
COURSE CODE	**603**	**SEMESTER**	SPRING - 6th
COURSE TITLE	**PLANT PATHOLOGY OF FLORICULTURAL AND HORTICULTURAL PLANTS**		

COURSE COMPONENTS	**WEEKLY LECTURE HOURS**	**CREDITS**
Theory	3	
Laboratory Work	2	
Total	5	6.0

TYPE OF COURSE:	Compulsory Specialization Course
PREREQUISITES:	None
TEACHING and ASSESSMENT EXAMINATION LANGUAGE:	Greek Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No
ONLINE COURSE PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/STEG123/

SKILLS DEVELOPMENT

Course Description and Learning Objectives
The course aims to provide students with the necessary knowledge to identify and manage parasitic and non-parasitic diseases of ornamental plants and vegetable crops.
Competencies
Upon successful completion of this course, students will be able to: • Identify the symptoms of the main diseases of ornamental plants and vegetable crops • Assess the expected impact on the quantitative and qualitative outcomes of production • Design and apply integrated pest control management programs based on the safety for humans and the environment

COURSE TOPICS AND SCHEDULE

Theory

- Taxonomy, morphology and life cycle of the main plant pathogens of ornamental and vegetable crops
- Symptoms and signs of main diseases (fungal, bacterial, viral) and nutrient deficiencies of ornamental plants and vegetable crops
- Cultural practices, biological and chemical methods for plant disease control
- Design and application of integrated pest management programs for the

main ornamental and vegetable crops

Laboratory Work

- The morphological characteristics of the main plant pathogens
- Identification of symptoms and signs of the main parasitic and non-parasitic diseases of ornamental plants and vegetable crops

TEACHING and LEARNING METHODS - ASSESSMENT

TEACHING MODE	Theory: auditorium lectures for all students Laboratory Work: laboratory exercises for students in small groups
USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Audiovisual teaching methods, teaching support through e-class learning platform
COURSE STRUCTURE	***COMPONENT*** / ***Semester Workload*** Theory: 39 Laboratory: 26 Study: 78 ***Course Total***: ***143***
STUDENT ASSESSMENT	Greek Theory: final written multiple choice or essay examination (100% of final grade) Laboratory Work: final written examination including multiple choice (60% of final grade) and problem solving questions (40% of final grade)

RECOMMENDED READING

- Lecture Notes

OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY AND TECHNOLOGY OF FOOD AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	Undergraduate		
COURSE CODE:	604	**SEMESTER**	6
COURSE TITLE:	**ANIMAL PESTS OF FLORICULTURAL AND HORTICULTURAL PLANTS**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Recitations	3THEORY+2LABS=5h/WEEK	6	
COURSE TYPE:	Specialization Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG159/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
This is a Compulsory – Scientific area course, introducing students to the meaning of insect pest management of vegetables and floricultural plants in greenhouses and outdoor cultivations. It aims to introduce students to the study of main harmful animals of the above crops (mainly insects, as well as mites, nematodes, other harmful animals). It focuses on the recognition of the above harmful species, to the description of the symptoms of their pests, to their biology and ecology and it gives the main methods of their control. Main target of the course is to make students able to know the importance of the pests in cultivations and to be able to choose the appropriate actions to reduce the populations of the insect pests. By the completion of the course, the student will be able to: Classify the harmful insects and other animals of the above cultivations. Distinguish the symptoms of the pests on cultivated plants. Evaluate the effects of the environmental conditions on the population dynamic. Identify the natural enemies of the harmful animals of the crops, where biological control is based on and estimate their potential efficiency against their hosts. Choose the most appropriate methods to control insect pests in the frame of Integrated Pest Management. Estimate the economy of the applied control method.
Competencies
Decision-making for evaluating and applying the most effective and economic methods for controlling insect pests, to avoid harmful effects to the environment.

Autonomous working in the field and in the laboratory.
Collaborative working with the farmers and other colleagues for applying an effective plant protection program in the cultivation.
Advancement of a way of thinking with respect to the environment, farmers and consumers.

COURSE TOPICS and SCHEDULE

A) Main insect pests of vegetables and floricultural plants (biology, damages, economic importance, ecology, natural enemies, control)
Orthoptera
Κολεόπτερα
Diptera
Lepidoptera
Hemiptera (aphids, whiteflies, scale insects)
Thysanoptera
Other harmful animals (mollusks, birds, rodents).
B) Main acari and nematodes infesting vegetables and floricultural plants (biology, damages, economic importance, ecology, natural enemies, control).

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	Lectures for the theoretical session. Practice session in laboratory: Insect Identification, recognition of insect pests' symptoms.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class, internet, insect preparations and permanent slides, insect collection, insect observation under stereoscope and microscope.
METHODS OF INSTRUCTION	***Method*** / ***Semester workload*** Lectures (Theory) / 39 Practice session in Laboratory / 26 Shelf - study / 78 ***Total workload in hours*** / ***143***
STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: I. Theory: A) project presentation (20% of the total score) B) Mid written exams that includes short answer questions. (40%) C) Final written exams that includes short answer questions. (40%). II. Laboratory: Oral exam in each laboratory exercise.

TEXTBOOK and OPTIONAL READING

Optional Reading:

Pollini A., Ponti, I., Laffi, A. F., 2010. Enemies of vegetables. (in Greece). Edition:

ΖΕΥΣ S.A. (ISBN: 9608591228).
Stathas, G.J., 2000. *Rhyzobius lophanthae* Prey consumption and Fecundity. *Phytoparasitica*, 28 (3) : 203-211.
Stathas, G.J., 2000. The effect of temperature on the development of the predator *Rhyzobius lophanthae* and its phenology in Geece. *BioControl*, 45: 439-451.
Stathas, G.J., Eliopoulos, P.A., Kontodimas, D.C. and Giannopapas, J., 2001. Parameters of reproductive activity in females of *Harmonia axyridis* (Coleoptera : Coccinellidae). *European Journal of Entomology*, 98 (4): 547-549.
Van Emden, H.F., 2014. Agricultural Entomology. (In Greek) Translation by Emmanuel, N. Scientific Editions Parissianou S.A., 322 p.
Veerman, A.1991. The Acari reproduction, development and life-history strategies. Chapman &Hall. London.

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	605	**SEMESTER**	6^{O}
COURSE TITLE:	**DECIDUOUS CROP TREES**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratory	3Lec.+2Lab./week	6	
COURSE TYPE:	Specialization course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
To provide the students with the knowledge which is necessary for the cultivation of the following deciduous species of tree crops and shrubs: •Pome fruits: apple, pear, quince, •Stone fruits: peach, nectarine, apricot, sour cherry, sweet cherry, plum, •Nuts: almond, pistachia, chestnut ,hazelnut, •Other deciduous tree crops : kiwi-fruit, fig tree, persimmon, pomegranate, cornus (common name dogwood), • Deciduous perpetual shrubs cultivated in Greece: aronia (common name chokeberry), hippophae, ziziphus.
Competencies
Decision making Autonomous working Collaborative working

COURSE TOPICS and SCHEDULE

•Origin, expansion, nutritional value and economic importance of the above mentioned crops.

•Identifying based on their morphological and botanical characteristics, the aforementioned trees-shrubs.

Knowing the soil and climatic requirements of the above mentioned trees-shrubs.

•Knowing the most important varieties and rootstocks used for the above mentioned crops.

•Nutritional requirements and cultivation treatments (fruit-thinning, irrigation, pruning, harvesting criteria and methods of harvesting) of the aforementioned deciduous tree crops and shrubs.

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	39
Laboratory	26
Shelf-study	78
Total workload in hours	***143***

STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) For the theoretical part written exam (100%) For the laboratory part written exam and orally.

TEXTBOOK and OPTIONAL READING

Textbooks:

•Fideghelli C. and F.R. De Salvador, 2009.Word hazelnut situation and perspectives. Acta Hort. 845: 39-52.

•Mantinger, H.1998. The cultivation of Fuji in south Tyrol in Italy. Compact Fruit tree. 31:1-15.

•Koukourikou-Petridou, M., Voyatzis, D., Stylianidikis, D., Sotiropoulos, T., and Therios, I.2007. Effect of some growth regulators on pre and after storage quality of Red Chief Delicious applas.Eur.J. Hort.Sci. 72: 8-11.

•Hampson, C., Kemp, H.2003. Characteristics of important commercial apple cultivars. In: Apples.Botany, production and uses. (D.Ferre,I.Warrington,eds.). p. 61-91.CABI publishing.London.

•Scortichini M., 2002.Bacterial canker and decline of European hazelnut.Plant Disease 86: 704-709.

VITICULTURE

OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	607	**SEMESTER**	6ο
COURSE TITLE:	**SOLANACEOUS & LEGUMINOUS PLANTS**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures + Laboratory Exercises	3+2=5	6	
COURSE TYPE:	Specialization course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives

The course aims to enable students to understand the modern production process of solanaceous (potato and industrial tomato) and leguminous plants (beans, chickpeas, lentils etc.).

At the end of the course, the optimally-successful student should be able to:

recognize seeds, plants and plant organs at various stages of plants development
know the quality characteristics of propagating material of the above plants
recognize the presence of symbiotic bacteria in the roots of legumes
understand the factors (biotic and abiotic) that affect the development of the above plants and the crop yields,
know the influence of cultivation techniques (fertilization, irrigation, crop protection, etc.) in crop yield
choose and apply the appropriate cultivation techniques in various cropping systems (intercropping, monoculture) or forms of agriculture activity (conventional, integrated, organic)
choose and apply the appropriate pre- and post-harvest treatments for the production of high quality products and for the preservation of quality characteristics during storage.

Competencies

Adapt to new situations
Decision making
Autonomous working
Team working
Work in an interdisciplinary environment
Respect to the natural environment
Work in an international environment
Develop new research ideas

COURSE TOPICS and SCHEDULE

Solanaceous (potato and industrial tomato) and leguminous plants (beans, chickpeas, lentils, vigna, dolichos, vetch, lupine, pea, ervil, alfalfa, clover etc.), and in particular:

1. biosystematics, origin and geographical spread,
2. economic importance of the crop and use of the products
3. description of the plant (morphological and anatomical characteristics)
4. physiology of the growth, development and yield
5. soil requirements and plant adaptability
6. plant improvement and cultivars
7. plant propagating material, sowing-planting a new crop
8. cultivation and production process
9. intervention during cultivation
10. quality characteristics of the products
11. post-harvest handling
12. Particular reference to the role of leguminous plants in modern cropping systems (intercropping, crop rotation), the symbiotic relationship between leguminous plants and nitrogen fixing bacteria, nodule formation physiology and factors affecting nitrogen fixation.

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class and in laboratory, open field and greenhouse.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload***
	Lectures: 39
	Laboratory Exercises: 26
	Shelf-study: 78
	Total workload in hours: 143
STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: I. Theoretical part of the course: Written term exam that includes development, short answer multiple choice questions or/and coursework. II. Laboratory part of the course: Written examination or laboratory work at the end of a laboratory exercise or a group of laboratory exercises.

TEXTBOOK and OPTIONAL READING

OPTIONAL READING

Benton Jones J. (1999). Tomato Plant Culture – in the field, greenhouse and home garden. CRC Press, N.Y.

Burton W.G. (1989). The Potato. Longman Scientific Technical.

Campbell K.P. (1994). Biology and Agronomy of forage Arachis. Cli, Colombia Centro International de Agricultura Tropical.

Dilworth M.J. (2008). Nitrogen-fixing Leguminous Symbioses. Springer, The Netherlands.

Dracup M. and Kirby E.J.M. (1996). Lupin development guide. University of Western Australia Press.

Hanerkort A.J. and MacKerron D.K.L (1995). Potato ecology and modeling of crops under conditions limiting growth (proceedings of the second international potato modelling conference, held in Wageningen 17-19 May, 1994). Kluwer Academic Publishers.

Harris P. (1992). The Potato Crop – the scientific basis for improvement. Chapman and Hall, London.

Heuvelink Ep (2005). Tomatoes. CABI Publishing, U.K.

Kokalis-Burelle N., Porter D.M., Rodriquez-Kabana B., Smith D.H. and Subrahmanyam P. (1997). Compendium of Peanut Diseases. Kluwer Academic Publishers.

Maxted N. and Bennet S.J. (2001). Plant Genetic Resources of Legumes in the Mediterranean. Kluwer Academic Publishers, The Netherlands.

McKersie B.D. and Brown D.C.W. (1997). Biotechnology and the Improvement of Forage Legumes. CABI Publishing, U.K.

Netherlands Catalogue of Potato Varieties (2003).

Pratar A. and Kumar J. (2011). Biology and Breeding of Food Legumes. CABI Publishing, U.K.

Rowe R.C. (1993). The Potato Health Management. APS Press, Minnesota, USA.

Singh S.P. (1999). Common Bean Improvement in the Twenty-First Century. Kluwer Academic Publishers.

Singh G. (2010). The Soybean: Botany, Production and Uses. CAB International.

Smart J. (1990). Grain Legumes: Evolution and Genetic Resources. Cambridge University Press.

Wilbur W.A. (1992). Tomato Production, Processing & Technology (3rd edition). CTI Publications Ing. USA.

OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	608	**SEMESTER**	6ο
COURSE TITLE:	**CEREALS**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures + Laboratory Exercises	3+2=5	6	
COURSE TYPE:	Specialization course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	No		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives

The course aims to enable students to understand the modern production process of the cereals: winter grains (wheat, barley, oats, rye, triticale) and spring grains (corn, rice, sorghum, millet), which are considered as the most important plants for human consumption on a global scale, and are of particular importance for the Greek rural economy.

At the end of the course, the optimally-successful student should be able to:

recognize seeds, plants and plant organs of cereals at various stages of their development

know the quality characteristics of seeds of cereals

understand the factors (biotic and abiotic) that affect the development of cereals and the crop yields,

know the influence of cultivation techniques (fertilization, irrigation, crop protection, etc.) in crop yield of cereals

choose and apply the appropriate cultivation techniques in various cropping systems (intercropping, monoculture) or forms of agriculture activity (conventional, integrated, organic)

choose and apply the appropriate pre- and post-harvest treatments for the production of high quality products and for the preservation of quality characteristics during storage.

Competencies

Adapt to new situations
Decision making
Autonomous working
Team working
Work in an interdisciplinary environment
Respect to the natural environment
Work in an international environment

Develop new research ideas

COURSE TOPICS and SCHEDULE

Winter grains (wheat, barley, oats, rye, triticale) and spring grains (corn, rice, sorghum, millet), and in particular:

1. biosystematics, origin and geographical spread,
2. economic importance of the crop and use of the products
3. description of the plant (morphological and anatomical characteristics)
4. physiology of the growth, development and yield
5. soil requirements and plant adaptability
6. plant improvement and cultivars
7. plant propagating material, sowing-planting a new crop
8. cultivation and production process
9. intervention during cultivation
10. quality characteristics of the products
11. post-harvest handling

TEACHING AND LEARNING METHODS - ASSESSMENT

<table>
<tr><td>TEACHING METHOD</td><td>In class and in laboratory, open field and greenhouse.</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>The teaching and learning process is supported by the electronic platform of e-class</td></tr>
<tr><td>METHODS OF INSTRUCTION</td><td>
<table>
<tr><th>Method</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>39</td></tr>
<tr><td>Laboratory Exercises</td><td>26</td></tr>
<tr><td>Shelf-study</td><td>78</td></tr>
<tr><td>Total workload in hours</td><td>143</td></tr>
</table>
</td></tr>
<tr><td>STUDENT LEARNING ASSESSMENT</td><td>Language of Assessment: Greek
Method of Assessment:
I. Theoretical part of the course:
Written term exam that includes development, short answer multiple choice questions or/and coursework.
II. Laboratory part of the course:
Written examination or laboratory work at the end of a laboratory exercise or a group of laboratory exercises.</td></tr>
</table>

TEXTBOOK and OPTIONAL READING

OPTIONAL READING

Cook J.R. and Roger V.J. (1991). Wheat Health Management. APS Press, USA.

Donald W.G. (1999). Compendium of Corn Diseases (3rd edition). American Phytopathological Society, USA.

Freeling M. and Walbot V. (1993). The Maize Handbook. Springer-Verlag, N.Y.
Kulp K. and Ponte G.J. (2000). Handbook of Cereal Science and Technology. Marcel Dekker.
Smith W.C. and Dilday R.H. (2003). Rice: Origin, History, Technology and Production. John Wiley & Sons Inc.
Smith W.C., Betran J. and Runge E.C.A. (2004). Corn: Origin, History, Technology, and Production. John Wiley & Sons Inc.
Williams J.T. (1995). Cereals and Pseudocereals. Chapman and Hall, London.

OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	701	**SEMESTER**	7ο
COURSE TITLE:	**POST-HARVEST MANAGEMENT – STANDARDIZATION OF AGRICULTURAL PRODUCTS**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratory Exercises	3+2=5	6	
COURSE TYPE:	Specialization course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course aims to provide students with the necessary knowledge related to post-harvest physiology and the necessary operations/treatments for the conservation and preservation of the quality of agricultural products (fruits, seeds, tubers, bulbs, flowers etc.) during storage. At the end of the course, the optimally-successful student should be able to: 1. understand the physiological changes that occur in the edible part of plants (fruits, seeds, tubers, shoots, inflorescences, leaves) after harvest-collection 2. understand the factors influencing the quality of the edible part of plants, before and after harvest-collection 3. use scientific instruments and apply laboratory techniques for assessing the quality of the edible part of the plants 4. apply appropriate operations to maintain the quality of the edible part of the plants during their storage
Competencies
Adapt to new situations Decision making Autonomous working Team working Work in an interdisciplinary environment Respect to the natural environment Work in an international environment Develop new research ideas

COURSE TOPICS and SCHEDULE

Structure and chemical composition of plant organs (fruits, leaves, ground

hoarders organs, stems, seeds, flowers)
Physiological and biochemical changes in agricultural products after harvest.
Quality characteristics of agricultural products.
Effect of pre- and post-harvest factors on quality characteristics of agricultural products.
Factors affecting the losses during postharvest handling.
Drying and storage of seeds, grass and fodder.
Storage of fruits, vegetables, underground organs. Criteria of harvesting / selecting.
Methods and systems of pre-freezing.
Injuries due to low temperatures.
Controlled and modified atmosphere.
Refrigerated transportation.
Enemies, diseases and physiological disorders during storage.
Special issues on the preservation of raw and dried plant products.
Materials of packing, processing and identification of agricultural products.

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class and in laboratory
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload*** Lectures: 39 Laboratory Exercises: 26 Shelf-study: 78 ***Total workload in hours***: ***143***
STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: I. Theoretical part of the course: Written term exam that includes development, short answer multiple choice questions or/and coursework. II. Laboratory part of the course: Written examination or laboratory work at the end of a laboratory exercise or a group of laboratory exercises.

TEXTBOOK and OPTIONAL READING

OPTIONAL READING

Brody L.A. (1989). Controlled /modified atmosphere vacuum packaging of foods. Food and nutrition Press.
Chakraverty A., Mujumdar A.S., Ramaswamy H.S. (2003). Handbook of Postharvest Technology: Cereals, Fruits, Vegetables, Tea, and Spices. Marcel

Dekker, Inc., USA.
Clijsters H., De Proft. M., Marcelle R. and Van Poucke M. (1988). Biochemical and Physiological Aspects of Ethylene Production in Lower and Higher Plants. Kluwer Acad. Publishers.
Kader A., Kasmire. F.R., GordonMitcell F., Reid S.M., Sommer F.N., Thompson F.J. (1985). Postharvest Technology of Horticultural Crops. Univ. of California.
Lloyd Ryall A. and Pentzer W.T. (1982). Handling, transportation and storage of fruits and vegetables. Avi Publ.
Mitra S. (1997). Post-harvest physiology and storage of tropical and subtropical fruits. CAB Intern.
Salunke D.K. and Kadam S.S. (1998). Handbook of vegetables Science and Technology. Marcel Dekker, Inc.
Thompson A.K. (1998). Controlled atmosphere storage of fruits and vegetables. Cab. Intern.
Weichmann J.(1987). Postharvest physiology of vegetables. Marcel Dekker. Inc.
Wiley C.R. (1994). Minimally processed refrigerated Fruits and vegetables. Chapman and Hall.
Wills R.B.H., McGlasson W.B., Graham. D., Lee T.H. and Hal E.G. (1998). Postharvest: An introduction to the physiology and handling of fruit and vegetables (4th edition). UNSW Press.

GREENHOUSE EQUIPMENT, OPERATION, AND AUTOMATIONS

HYDROPONICS – SOILLESS CROPS

GENERAL

SCHOOL	AGRICULTURAL TECHNOLOGY & FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT	AGRICULTURAL TECHNOLOGY		
EDUCATION LEVEL	Undergraduate		
COURSE CODE	**704**	**SEMESTER**	AUTUMN - 7th
COURSE TITLE	**PLANT PATHOLOGY OF FRUIT, VEGETABLES AND FIELD CROPS**		

COURSE COMPONENTS	**WEEKLY LECTURE HOURS**	**CREDITS**
Theory	3	
Laboratory Work	2	
Total	5	6.0

TYPE OF COURSE:	Compulsory Specialization Course
PREREQUISITES:	None
TEACHING and ASSESSMENT EXAMINATION LANGUAGE:	Greek Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	No
ONLINE COURSE PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/STEG123/

SKILLS DEVELOPMENT

Course Description and Learning Objectives
The course aims to provide students with the necessary knowledge to identify and manage parasitic and non-parasitic diseases of fruit, vegetables and field crops.
Competencies
Upon successful completion of this course, students will be able to: • Identify the symptoms of the main diseases of fruit, vegetables and field crops • Assess the expected impact on the quantitative and qualitative outcomes of production • Design and apply integrated pest control management programs based on the safety for humans and the environment

COURSE TOPICS AND SCHEDULE

Theory

- Taxonomy, morphology and life cycle of the main plant pathogens of of fruit, vegetables and field crops
- Symptoms and signs of main diseases (fungal, bacterial, viral) and nutrient deficiencies of ornamental plants and vegetable crops
- Cultural practices, biological and chemical methods for plant disease control
- Design and application of integrated pest management programs for the main fruit, vegetables and field crops

Laboratory Work

- The morphological characteristics of the main plant pathogens
- Identification of symptoms and signs of the main parasitic and non-parasitic diseases of fruit, vegetables and field crops

TEACHING and LEARNING METHODS - ASSESSMENT

TEACHING MODE	Theory: auditorium lectures for all students Laboratory Work: laboratory exercises for students in small groups
USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Audiovisual teaching methods, teaching support through e-class learning platform
COURSE STRUCTURE	

COMPONENT	***Semester Workload***
Theory	39
Laboratory	26
Study	78
Course Total	***143***

STUDENT ASSESSMENT	Greek Theory: final written multiple choice or essay examination (100% of final grade) Laboratory Work: final written examination including multiple choice (60% of final grade) and problem solving questions (40% of final grade)

RECOMMENDED READING

- Lecture Notes

OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY AND TECHNOLOGY OF FOOD AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	Undergraduate		
COURSE CODE:	705	**SEMESTER**	7
COURSE TITLE:	**FRUIT VEGETABLES AND FIELD CROPS SPECIALIZED ENTOMOLOGY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Recitations	3THEORY+2LABS=5h/WEEK	6	
COURSE TYPE:	Specialization Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/STEG108/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
This is a Compulsory – Scientific area course, introducing students to the meaning of insect pest management of fruits, vegetables and field crops. It aims to introduce students to the study of main harmful insects of the above crops (and some mites, nematodes, or other harmful animals). It focuses on the recognition of the above harmful species, to the description of the symptoms of their pests, to their biology and ecology and it gives the main methods of their control. Main target of the course is to make students able to know the importance of the pests in cultivations and to be able to choose the appropriate actions to reduce the populations of the insect pests. By the completion of the course, the student will be able to: Classify the harmful insects and other animals of the above cultivations. Distinguish the symptoms of the pests on cultivated plants. Evaluate the effects of the environmental conditions on the population dynamic. Identify the natural enemies of the harmful animals of the crops, where biological control is based on and estimate their potential efficiency against their hosts. Choose the most appropriate methods to control insect pests in the frame of Integrated Pest Management. Estimate the economy of the applied control method.
Competencies
Decision-making for evaluating and applying the most effective and economic methods for controlling insect pests, to avoid harmful effects to the environment. Autonomous working in the field and in the laboratory.

Collaborative working with the farmers and other colleagues for applying an effective plant protection program in the cultivation.
Advancement of a way of thinking with respect to the environment, farmers and consumers.

COURSE TOPICS and SCHEDULE

Study of the most harmful insects and some mites and nematodes, (biology, economic importance, ecology, natural enemies, control) on the following cultivations:
Olive trees
Citrus
Pome trees
Stone trees
Tree nuts
Vineyards
Vegetables
Field crops

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	Lectures for the theoretical session. Practice session in laboratory: Insect Identification, recognition of insect pests' symptoms.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class, internet, insect preparations and permanent slides, insect collection, insect observation under stereoscope and microscope.
METHODS OF INSTRUCTION	***Method*** / ***Semester workload*** Lectures (Theory) — 39 Practice session in Laboratory — 26 Shelf - study — 78 ***Total workload in hours*** — ***143***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: I. Theory: A) project presentation (20% of the total score) B) Mid written exams that includes short answer questions. (40%) C) Final written exams that includes short answer questions. (40%). II. Laboratory: Oral exam in each laboratory exercise.

TEXTBOOK and OPTIONAL READING

Optional Reading:

Carter, W.1962. Insects in relation to plant disease. Interscience Publs, New York.

Della Beffa G. 1962. Γεωργική Εντομολογία. Μετάφραση Γ.Ι Καραμάνου και Σπ. Μαρσέλου. Εκδ. Μ.Χ Γκιούρδας, Αθήνα ,2 τόμοι.

Dent, D.R. and Walton, M.P., 1997. Methods in ecological & agricultural entomology. Cab International, London, Washington.

Hill, D. 1979. Agricultural Insect Pests of the Tropica and their control. Cambridge University Press, Cambridge, U.K.

Jervis, M. and Kidd N., 1997. Insect Natural Enemies: Practical approaches to their study and evaluation. Chapman Hall, London, New York, Tokyo, Melbourne.

Katsoyannos, P., 1996. Integrated Insect Pest Management for citrus in northern Mediterranean countries. Benaki Phytopathological Institute.

Stathas, G.J. and Kozár, 2008. *Chrysomphalus aonidum* as a pest of citrus in Greece. *Entomologia Hellenica*, 16 (2005-2006): 16-21.

Stathas, G.J., Kartsonas, E.D. & D.C., Kontodimas, 2008. New hosts for the pyriform *scale Protopulvinaria pyriformis* (Cockerell) (Hemiptera: Coccidae) in Greece. *Entomologia Hellenica*, 17: 56-59.

Veerman, A. 1991. The Acari reproduction, development and life-history strategies. Chapman &Hall. London.

ELECTIVE COURSES

ELECTIVE COURSE GROUP A.E.L.H.

GENERAL

SCHOOL	Agricultural Technology & Food Technology and Nutrition		
ACADEMIC UNIT	Department of Agricultural Technology		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	712	**SEMESTER**	7th
COURSE TITLE	**MARKETING OF AGRICULTURAL PRODUCTS AND FOODS**		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Practice		3+2=5	6
COURSE TYPE	Specialised general knowledge (Administration, Economy, Legislation and Humanities Courses)		
PREREQUISITE COURSES:	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	http://www.eclass.teipel.gr/eclass2/courses/ACRPR131/		

LEARNING OUTCOMES

Learning outcomes
This course is the basic introductory course on the concepts of marketing and sales techniques of agricultural and food products. This course aims to introduce students to the basic concepts of supply, demand and markets theory, and contributes to the understanding of the formation of consumer behaviour. The marketing mix is also analysed and the marketing environment that the student have a good understanding of the procedures and methodologies layout of business promotional strategies, and is a comprehensive reference to the promotion of products of the primary sector of the economy, taking into account the qualitative dimension of production. In this sense the course is the basis on which specific

methodologies and sales promotion analysis techniques allow students to appreciate both the tendency of markets, and alternative promotional projects of agricultural products and foods.
Finally, the aim of the course is the understanding by students of the structure and retail trends for agricultural products and foods in order to have a much as possible successful connection of primary production to the trends of domestic and international market.
Upon successful completion of the course, the student will be able to:
• Understand basic and critical features of the supply, demand and markets theory, and the theory of consumer behaviour.
• Have knowledge of the tools and techniques of sales promotion of agricultural products and foodstuffs.
• Know the basic characteristics of agricultural production and how they relate and affect marketing.
• Discern trends in agricultural markets and food quality dimension of production.
• Have an initial information on the export marketing
• Conduct market case studies.

General Competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Project planning and management

SYLLABUS

Basic concepts
Connecting the enterprise with the market
Consumer's behaviour
Marketing environment and marketing mix
Product
Price
Distribution (place)
Promotion
Agricultural products and marketing
Retailing of agricultural products and food in Greece
Export marketing of agricultural products and foods

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face

<table>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td><td>Learning support through the web based e-class platform</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>39</td></tr>
<tr><td>Practice</td><td>26</td></tr>
<tr><td>Project</td><td>52</td></tr>
<tr><td>Self-study</td><td>78</td></tr>
<tr><td></td><td></td></tr>
<tr><td>Course total</td><td>195</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>Final exam (80% of credits)
Project (20% of credits)</td></tr>
</table>

ATTACHED BIBLIOGRAPHY

Suggested bibliography:

Abbott J. (Ed.) (1996), Agricultural and Food Marketing in Developing Countries: Selected Readings, CAB International, U.K.

Aurier Ph. - Siriex L. (2010), Marketing αγροτικών προϊόντων και τροφίμων. Οι ιδιαιτερότητες του κλάδου – Στρατηγικές – Προγράμματα δράσης, Εκδόσεις Προπομπός, Αθήνα

Baker S. (2003), New consumer marketing. Managing a living demand system, Willey, West Sussex

Baudrillard J. (1970), La société de consummation, Éditions Denoel, folio essais, Paris

Cruchant L. (1998), La qualité, Ed. PUF, Collection Que sais-je?, Paris

Doole I. and Lowe R. (1997), International Marketing Strategy, International Thomson Business Press

Douglas M., Isherwood B. (2007), Pour une anthropologie de la consommation, Éditeurs IFM / REGARD, Paris (Αγγλικός τίτλος: The World of Goods. Towards an Anthropology of Consumption)

Fischler Cl. (1993), L'Homnivore, Ed. Odile Jacob, Collection Points, Paris

Gicquel Y. (2008), Nous, les consommateurs, Le Génie des Glaciers éditeur, Paris

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Kapferer J-N, Thoenig J-Cl. (1994), La marque, Ed. Ediscience International

Kotler Ph. (2000), Marketing - Management. Ανάλυση, Σχεδιασμός, Υλοποίηση & Έλεγχος, Διεθνής Έκδοση, Αθήνα

Lamine Cl. (2008), Les intermittents du bio. Pour une sociologie pragmatique des choix alimentaires émergents, Ed. Quae, Versailles

Lewi G., Lacoeuilhe J. (2007), Branding management, Pearson Editions, Paris

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Martimort D. (Ed.) (1996) Agricultural Markets: Mechanisms, Failures and Regulations, Ed. Elsevier Science B.V.
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Nicolas F., Valceschini E. (Ed.) (1995), Agro-alimentaire: une économie de la qualité, Ed. INRA – Economica. Paris
O.C.D.E. (1995), Le cycle d'Uruguay : Evaluation préliminaire des conséquences de l'accord sur l'agriculture dans les pays de l'OCDE, Ed. OCDE, Paris
Padberg D.I., Ritson C., Albisu L.M. (1997), Agro-food marketing, CAB International, U.K.
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Γαλάνη Β. (1995), Αγροτικό Μάρκετινγκ, Εκδ. Σταμούλης, Αθήνα.
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Σιώμκος Γ. (2011), Συμπεριφορά Καταναλωτή και Στρατηγική Μάρκετινγκ, Εκδόσεις Σταμούλη, Αθήνα

- *Related academic journals:*

OPTIONS méditerranéennes (Cahiers) (1998), The Common Agricultural Policy of the European Union : New Market Trends, CIHEAM, Mediterranean Agronomic Institute of Chania
Σελφ σερβις on line

OVERVIEW

SCHOOL	AGRICULTURAL TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL	*Undergraduate*		
COURSE CODE	**704**	**SEMESTER**	7th
COURSE TITLE	**FARM MANAGEMENT**		

INDEPENDENT DIDACTIC ACTIVITIES	**WEEKLY TEACHING HOURS**	**ECTS CREDITS**
Lectures and Practice Exercises	3+2	6

COURSE TYPE	General Knowledge
COURSE PREREQUISITES:	
TEACHING and EXAMINATION LANGUAGE	Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO
COURSE WEB PAGE	

LEARNING OUTCOMES

The aim of this particular course is to offer students specific knowledge on the organisation and management of agricultural exploitations. Another main aim is to explain the necessity of analysis for optimum decision-making and production process planning.
Upon successful completion of the course, students will be able to:
Understand the critical characteristics and specificities of agricultural business organisation and management.
Distinguish the basic economic laws and the way in which they affect the decisions of producers of agricultural products.

General Competencies

Decision-making
Independent Work
Team Work
Project Planning and Management
Exercising judgment and self-refection
Promotion of free, creative and inductive thinking

COURSE CONTENT

Specific characteristics of the agricultural sector (physical, structural).
Production coefficients and production process.
Relations between production coefficient and product produced
Relations between products or production sectors
Analysis of the main forms of economic results
Organization of production of agricultural products
Production Cost Analysis.
Costing methods
Necessity of programming and business objectives.
Production planning in agricultural production.
Decision-making and planning applications SWOT analysis
Businesses as economic organizations Business environment

TEACHING and LEARNING METHODS - ASSESSMENT

INSTRUCTION METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The learning process is supported through the e-class electronic platform
TEACHING ORGANISATION	

Activity	***Semester workload***
Lectures	39
Practice Exercises	26
Team Work on Case Study	30
Independent Study	100
Course Total	***195***

STUDENT ASSESSMENT	I. Written examination (80%) including: - Multiple choice questions - Short answer questions - Problem solving II. Group Assignment Presentation (20%)

RECOMMENDED READING

-Suggested Reading:
-Related Scientific Journals:

GENERAL

SCHOOL	Agricultural Technology & Food Technology and Nutrition		
ACADEMIC UNIT	Department of Agricultural Technology		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	714	**SEMESTER**	7th
COURSE TITLE	**AGRICULTURAL ECONOMY AND SOCIAL UNIONS**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Practice	3+2=5	6

COURSE TYPE	Specialised general knowledge (Administration, Economy, Legislation and Humanities Courses)
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	

LEARNING OUTCOMES

Learning outcomes
This course is the basic introductory course on the concepts of agricultural economy and how it affects the organization of rural collectivities, their forms of organization and the way we study them. This course aims to introduce students to the basic concepts of the theory of rural sociology, and contributes to the understanding of the formation of professional and non-professional groups of rural areas. We also analyze the factors affecting the development of rural residents and approaches and research of social phenomena. Elements of the social economy and the ways of cooperation between agricultural - farms, as well as the cooperative organization and the prospects of the cooperative movement within the EU are presented. In this sense the course is the basis on which specific methodologies and analysis techniques of rural society, and the different types of organization will enable graduates of the department can integrate more easily in their workplace, namely in the rural society. Upon successful completion of the course, the student will be able to: Understand basic and critical features of the theory of the agricultural economy and sociology, and the social economy theory.

Have knowledge of tools and techniques for analyzing social phenomena of the countryside.
Know the basic characteristics of rural cooperatives and producer groups
Can discern trends of the organization of rural social groups and ways of using European regulations.
Can coordinate the different types of producer groups, for the realization of specific business projects, e.g. special products, organic, GI, etc.

General Competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Project planning and management

SYLLABUS

Basic concepts of agricultural economy and sociology
Introduction to social economy
The human factor as factor shaping rural consciousness and culture
Economic environment of the rural community
Sociological Research
The cooperative movement - Agricultural Cooperatives
Relationship between cooperatives and producer groups
Agricultural cooperatives and EU
Agricultural applications.

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY.	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Learning support through the web based e-class platform
TEACHING METHODS	

Activity	***Semester workload***
Lectures	39
Practice	26
Project	52
Self-study	78
Course total	***195***

STUDENT PERFORMANCE EVALUATION	Final exam (80% of credits) Project (20% of credits)

ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

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Αβδελίδη Π. Σ. (1986), Το αγροτικό συνεταιριστικό κίνημα στην Ελλάδα, Εκδ. Παπαζήσης, Αθήνα.

Δαουτόπουλος Γ. (1994), Μεθοδολογία Κοινωνικών Ερευνών στον Αγροτικό Χώρο, Εκδ. Γ. Α. Δαουτόπουλος, Θεσσαλονίκη.

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Μπρακατσούλας Β. (1984), Το Αγροτικό Πρόβλημα και Κίνημα στην Ελλάδα, Εκδ. Παπαζήσης, Αθήνα.

Νασιούλας Ι. (2012) Η κοινωνική οικονομία της Ελλάδας και το κοινωνικό κεφάλαιο, Ινστιτούτο Κοινωνικής Οικονομίας, Αθήνα

Σιφνιώτης Κ. (1990), Συνεταιριστική Οικονομία, Εκδ. Κριτική Επιστημονική

Βιβλιοθήκη.
Τοτομιάντς Β. (1934), Η θεωρία του συνεργατισμού, Τυπογραφείον Καλέργη & ΣΙΑ, Αθήνα.

GENERAL

SCHOOL	Agricultural Technology & Food Technology and Nutrition		
ACADEMIC UNIT	Department of Agricultural Technology		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	715	**SEMESTER**	7th
COURSE TITLE	**ECOSYSTEMS – DEVELOPMENT STANDARDS**		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Practice	3+2=5	6

COURSE TYPE	Specialised general knowledge (Administration, Economy, Legislation and Humanities Courses)
PREREQUISITE COURSES:	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE WEBSITE (URL)	

LEARNING OUTCOMES

Learning outcomes
This course is the basic introductory course on the concepts of ecosystems and environmental economics. The course aims to introduce students to basic concepts such as: Population – Biocommunity – Biotope, as well as the theory of systems and entropy. The factors that influence the development and properties of ecosystems are analyzed. The conditions needed for maintaining an ecosystem are also analyzed We present elements of environmental economics in order to understand the extent of financial impact of human activities on the environment and the European policy on the environment and ecosystems and prospects. Finally there is an approach to European and Greek experience of ecosystem recovery and standards of their maintenance and upgrading policies. In this sense the course is the basis on which specific methodologies and analytical techniques an ecosystem will enable graduates of the department to gain a more complete picture of the economics of interventions made or planned to make the natural environment in which they work. Upon successful completion of the course, the student will be able to:

Understand basic and critical features of the theory of ecology, systemic analysis, and the theory of environmental economics.
Have knowledge of tools and analysis techniques of the ecosystems and the economy.
Know the main features of European philosophy and policy for natural environment and the ways of utilization.
Discern the suitability and exploit European regulations.
Coordinate the different types of interventions, such as for the implementation of specific business plans, but based on the most advantageous for nature and society perspective, etc.

General Competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Project planning and management

SYLLABUS

Basic concepts: ecology and economy
Environmental economics
Systemic approach
Economic - social - environmental sustainability
Ecology and development
Environmental pollution
Cities' expansion
Technology, industrialization and environment
European environment policy
The European experience
The Greek experience

TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Learning support through the web based e-class platform
TEACHING METHODS	

Activity	***Semester workload***
Lectures	39
Practice	26

	Project	52
	Self-study	78
	Course total	***195***
STUDENT PERFORMANCE EVALUATION	Final exam (80% of credits) Project (20% of credits)	

ATTACHED BIBLIOGRAPHY

Suggested bibliography:

Bookchin M. (1993), Η σύγχρονη οικολογική κρίση, Εκδ. Βιβλιοπέλαγος, Αθήνα.
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Σιάρδος Γ., Κουτσούρης Α. (2004), Αειφορική Γεωργία & Ανάπτυξη, Εκδόσεις Ζυγός, Θεσσαλονίκη
Τσιούρης Σ.Ε., Γεράκης Π.Α. (2010), Υγρότοποι και Γεωργία, Διαθέτης (Εκδότης): Χριστίνα και Βασιλική Κορδαλή Ο.Ε.

ELECTIVE COURSE GROUP 1

OVERVIEW

SCHOOL:	Agricultural Technology & Food Technology and Nutrition		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	507	**SEMESTER**	5th
COURSE TITLE:	**APPLIED BIOTECHNOLOGY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Practical Courses	3+2=5	6	
COURSE TYPE:	Agricultural Science		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/ABGRFL131/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
Applied biotechnology provides to students the opportunity of being familiar with modern procedures and scientific approaches such as molecular biology, genome engineering, and molecular recombination. The students learn the methodology of agricultural and model plant transformation using Agrobacterium lines. Furthermore, biotechnological applications in agricultural systems for transgenic plant production are presented. At the end of theoretical courses the students are able to understand and develop systems for plant genome modifications. The practical courses the students learn how to subclone DNA into plasmid vectors and how to modify Arabidopsis plants using floral dip method and create stable genome modifications.
Competencies
Basic rules subcloning GMOs Detection Plant transformation

COURSE TOPICS and SCHEDULE

Unit 1: Methods in Molecular Biology 1. Tissue culture 2. Restriction Enzymes 3. PCR technique- Real time PCR 4. Molecular Recombination cDNA libraries 5. RNAi phenomenon Unit 2: Plant Transformation

6. Agrobacterium mediated transformation
7. Agrobacterium mediated transformation
8. Arabidopsis Transformation
9. Transient expression of proteins

Unit 3: Applications

10. Agronomic traits
11. Purple tomatoes-Golden rice
12. GMOs Detection
13. CRISPR-CAS9 system

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	39
The lectures are available to the students in e-class platform. Furthermore, in the practical section in small group training courses the students have the opportunity learn how to use molecular biology techniques.	26
Shelf-study	78
Total workload in hours	***143***

STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Optional Exams for the students during semester Written term exam that includes: - Multiple choice questions - Short answer questions In practical courses the students take exams in every course and have the opportunity to evaluate their performance.

TEXTBOOK and OPTIONAL READING

Book [371]: ΒΙΟΤΕΧΝΟΛΟΓΙΑ ΦΥΤΩΝ, Πολυδεύκης Χατζόπουλος Λεπτομέρειες (Details)

Book [7783]: ΑΝΑΠΤΥΞΙΑΚΗ ΜΟΡΙΑΚΗ ΒΙΟΛΟΓΙΑ ΦΥΤΩΝ, Κοσμάς Χαραλαμπίδης, Δήμητρα Μηλιώνη, Κρίτων Καλαντίδης, Καλλιόπη Παπαδοπούλου, Σταμάτης Ρήγας, Ανδρέας Ρούσσης, Πολυδεύκης Χατζόπουλος Λεπτομέρειες (Details)

ALTERNATIVE CROPS

OVERVIEW

SCHOOL:	School of Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	509	**SEMESTER**	5th
COURSE TITLE:	**APPLIED PLANT PHYSIOLOGY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Lab. exercises	3+2=5	6	
COURSE TYPE:	Scientific Area		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/STEG118/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The aim of this course is to give students a greater understanding of the physiological processes, plant responses and environmental factors affecting growth and productivity of the agricultural crops, and to stimulate students' learning of basic concepts in crop growth and development. The course is also designed to enable students to use the knowledge of crop physiology to answer practical questions.
Competencies
Autonomous working and collaborative working Advancement of a free, productive and inductive mind Critical thinking and problem solving skills with respect to crop physiology

COURSE TOPICS and SCHEDULE

1. Define and analyze the mechanisms by which crop plants acquire and utilize resources like carbon, water, light and mineral nutrients.
2. Describe in detail the physiology and biochemistry of crop seed germination and dormancy.
3. Examine the physiology of crop adaptation to their environment.
4. Review the physiological basis for crop production and management practices.

Learning Outcomes

On completion of the course students should be able to:

1. Distinguish key physiological processes underlying the formation of seedlings from seed embryos (Seed Physiology - Seed structure and its composition - Seed storage reserves - Seed imbibition and germination - Metabolic and cellular events during germination - Physiology of seed dormancy - Mobilization of storage reserves and its control).
2. Identify the physiological factors that regulate growth and developmental processes of crop plants.
3. Develop an understanding of Plant Growth Regulators

4. Recognize the significance of assimilate translocation and patterns of its partitioning in determining crop yield.
5. Demonstrate clear understanding of crop-environment interaction and its implication on crop growth and yield.
6. Acquire knowledge of crop stress physiology - Flooding and hypoxic stress: the suffocation of plant tissues - Water deficit and drought tolerance - Temperature stress: the heat, the chill and the freeze - Salinity stress: the salt injury.
7. Relate crop physiological processes with agronomic practices used in crop production systems.

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload***
	Lectures: 39
	Laboratory exercises: 26
	Shelf-study: 78
	Total workload in hours: ***143***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Written term exam that includes: - Multiple choice questions - Short answer questions

TEXTBOOK and OPTIONAL READING

Bennet, W. 1993. Nutrient Deficiencies & Toxicities In Crop Plants. APS Press. Minnesota, USA.

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OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	510	**SEMESTER**	5ο
COURSE TITLE:	**AROMATIC, MEDICINAL AND OIL PLANTS**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures + Laboratory Exercises	3+2=5	6	
COURSE TYPE:	Special Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives

The course aims to enable students to understand the production process of pharmaceutical and aromatic plants (achillea, valerian, St. John's wort, basil, anise, rosemary, Dittany, mint, Echinacea, savory, thyme, coriander, saffron, cumin, lavender, verbena, hops, fennel, lemon balm, mint, oregano, salvia, linden, mountain tea, sage, linden, chamomile), plants with medicinal properties (eg. aloe, stevia, ginger), wild medicinal or/and aromatic plants and oleaginous plants (soybeans, groundnut).

At the end of the course, the optimally-successful student should be able to:

- know the uses of aromatic, pharmaceutical and oleagenous plants and the ways for receipt of products (essential oils, etc.)
- recognize seeds, plants and plant organs of aromatic, pharmaceutical and oleagenous plants at various stages of their development
- know the quality characteristics of propagating material of the above plants
- understand the factors (biotic and abiotic) that affect the development of the above plants and crop yields
- choose and apply the appropriate cultivation techniques in various cropping systems (intercropping, monoculture) or forms of agriculture activity (conventional, integrated, organic)
- choose and apply the appropriate pre- and post-harvest treatments for the production of high quality products and for the preservation of the quality characteristics during storage.

Competencies

Adapt to new situations
Decision making
Autonomous working
Team working
Work in an interdisciplinary environment

Respect to the natural environment
Work in an international environment
Develop new research ideas

COURSE TOPICS and SCHEDULE

The pharmaceutical and aromatic plants (achillea, valerian, St. John's wort, basil, anise, rosemary, Dittany, mint, Echinacea, savory, thyme, coriander, saffron, cumin, lavender, verbena, hops, fennel, lemon balm, mint, oregano, salvia, linden, mountain tea, sage, linden, chamomile), plants with medicinal properties (eg. aloe, stevia, ginger), wild medical or/and aromatic plants and oleaginous plants (soybeans, groundnut), and in particular:

1. biosystematics, origin and geographical spread,
2. economic importance of the crop and use of the products
3. description of the plant (morphological and anatomical characteristics)
4. soil requirements and plant adaptability
5. plant propagating material, sowing-planting a new crop
6. cultivation and production process
7. harvest,
8. quality characteristics of the products,
9. interventions during cultivation and post-harvest on the product.
10. Particular reference is made to the importance of biodiversity of aromatic and medicinal plants and the role of substances with medicinal properties, and particularly the essential oils (biosynthesis, their role in plants) and their collection, preservation methods.

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class and in laboratory, open field and greenhouse.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload*** Lectures: 39 Laboratory Exercises: 26 Shelf-study: 78 ***Total workload in hours***: ***143***
STUDENT LEARNING ASSESMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: I. Theoretical part of the course: Written term exam that includes development, short answer multiple choice questions or/and coursework. II. Laboratory part of the course: Written examination or laboratory work at the end of a laboratory exercise or a group of laboratory

	exercises.

TEXTBOOK and OPTIONAL READING

OPTIONAL READING

1. Bajaj V.P.S (1996). Medical and Aromatic Plants (I-IX). Springer-Verlag, Berlin.
2. Campbell K.P. (1994). Biology and Agronomy of forage Arachis. Cli, Colombia Centro International de Agricultura Tropical.
3. Chandra S., Lata H. and Varma A. (2013). Biotechnology for Medicinal Plants: Micropropagation and Improvement. Springer.
4. Chevallier A. (2001). Encyclopedia of Medicinal Plants. Dorling Kindersley, Ltd. Great Britain.
5. Commonwealth Secretariat (2001). A Guide to the European Market for Medicinal Plants and Extracts. London, UK.
6. Conservation, TRAFFIC International, Cambridge, U.K.
7. Johnson C.B. and Franz C. (2000). Breeding research on aromatic and medicinal plants. The Haworth Herbal Press. Haworth Press, Inc. N.Y.
8. Kinghorn D.A. (2004). Stevia: The Genus Stevia. Taylor & Francis.
9. Kokalis-Burelle N., Porter D.M., Rodriquez-Kabana B., Smith D.H. and Subrahmanyam P. (1997). Compendium of Peanut Diseases. Kluwer Academic Publishers.
10. Maiti R.K., Wesche-Ebeling P. (2002). The Peanut (Arachis hypogaea) Crop. Science Publishers.
11. Margaris Á. S., Koedam A. and Vokou D. (1982). Aromatic Plants: Basic and Applied Aspects. Martinus Nijhoff Publishers, The Hague, The Netherlands.
12. Ody P. (1993). The Herbs Society's Complete Medicinal Herbal. Dorling Kindersley limited, London.
13. Pakrashi S.C. and Pakrashi A. (2003). Ginger: A Versatile Healing Herb. Vedams ebooks Pvt, Ltd.
14. Panda H. (2003). Aloe Vera Handbook Cultivation, Research Finding, Products, Formulations, Extraction & Processing. National Institute Of Industrial Re.
15. Panda H. (2009). Aromatic Plants Cultivation, Processing and Uses. Asia Pacific Business Press,
16. Pengelly A. (1997). The Constituents of Medical Plants: an Introduction to the Chemistry and Therapeutics of Herbal Medicines. Merriwa (N.S.W) Sunflower Herbal 2nd ed.
17. Peter K.V. (2006). Handbook of Herb and Spices (vol. 1-3). CRC Press, N.Y.
18. Ravindran P.N. and Babu K.N. (2005). Ginger – The Genus Zingiber. CRC Press.
19. Shiva M.P., Lehri A. and Shiva A. (2002). Aromatic and medicinal plants: yielding essential oil for pharmaceutical, perfumery, cosmetic industries and trade. International Book Distributors.
20. Singh G. (2010). The Soybean: Botany, Production and Uses. CAB International.
21. Weiss E.A (1999). Essential Oil Crops. Walling Ford: CABI Publishing, U.K.

ELECTIVE COURSE GROUP 2

OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	609	**SEMESTER**	6^{o}
COURSE TITLE:	**INDUSTRIAL AND ENERGY PLANTS**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures + Laboratory Exercises	3+2=5	6	
COURSE TYPE:	Special Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	No		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course aims to enable students to understand the modern production process of the major industrial plants: (a) fiber (cotton, flax, hemp), (b) tobacco, (c) sugar beet, (d) energy (sunflower, safflower, rapeseed, sesame, castor). Upon successful completion of this course, students will be able to demonstrate an understanding of: (1) the contemporary production process of the cultivation of industrial and energy plants, (2) acquire the necessary applied knowledge to meet the demands of modern cultivation methods of the products of the above industrial and energy plants. At the end of the course, the optimally-successful student should be able to: recognize seeds, plants and plant organs of the industrial and energy plants at various stages of their development know the quality characteristics of seeds of the industrial and energy plants understand the factors (biotic and abiotic) that affect the development of industrial and energy plants and the crop yields, know the influence of cultivation techniques (fertilization, irrigation, crop protection, etc.) in crop yield of industrial and energy plants choose and apply the appropriate cultivation techniques in various cropping systems (intercropping, monoculture) or forms of agriculture activity (conventional, integrated, organic) choose and apply the appropriate pre- and post-harvest treatments for the production of high quality products and for the preservation of quality characteristics during storage.
Competencies
Adapt to new situations Decision making

Autonomous working
Team working
Work in an interdisciplinary environment
Respect to the natural environment
Work in an international environment
Develop new research ideas

COURSE TOPICS and SCHEDULE

Industrial plants (cotton, flax, hemp, sugar beet, tobacco) and energy plants (sunflower, safflower, rapeseed, sesame, castor), and in particular:

1. biosystematics, origin and geographical spread,
2. economic importance of the crop and use of the products
3. description of the plant (morphological and anatomical characteristics)
4. physiology of the growth, development and yield
5. soil requirements and plant adaptability
6. plant improvement and cultivars
7. plant propagating material, sowing-planting a new crop
8. cultivation and production process
9. intervention during cultivation
10. quality characteristics of the products
11. post-harvest handling

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class and in laboratory, open field and greenhouse
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload***
	Lectures: 39
	Laboratory Exercises: 26
	Shelf-study: 78
	Total workload in hours: ***143***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek Method of Assessment: I. Theoretical part of the course: Written term exam that includes development, short answer multiple choice questions or/and coursework. II. Laboratory part of the course: Written examination or laboratory work at the end of a laboratory exercise or a group of laboratory exercises.

TEXTBOOK and OPTIONAL READING

OPTIONAL READING

Asadi M. (2007). Beet-Sugar Handbook. John Wiley & Sons.

Bajaj Y.P.S. (1998). Cotton. Springer, N.Y.

Carter J. (1978). Sunflower Science and Technology. American Society of Agronomy, Madison Wisc.

Cheesman O.D. (2004). Environmental Impacts of Sugar Production: The Cultivation and Processing Of Sugarcane and Sugar Beet. CAB International.

Layten D. et al. (1999). Tabacco: production, chemistry and technology. Oxford, Blackwell Science

Draycott P.A. (2006). Sugar Beet. Blackwell Publishing Ltd.

Frisbie R.E., Kamal M.El-Zik. and Ted Wilson L. (1989). Off prints from: Integrated Pest Management Systems and Cotton Production, IED. John Wiley & Sons, Inc.

Hake S. Johnson et al 1996. Cotton production manual. Division of Agriculture and natural resources, California.

Hake S., Johnson T., Kerby A. and Hake K.D. (1996). Cotton Production Manual. University of California, Division of Agriculture and Natural Resources.

Hillocks P.J. (1992). Cotton Diseases. CAB International.

Kamal M et al. (1989). Integrated Pest Management and Cotton Production. John Wiley and Sons, N.Y

Layten D.D. and Nielsen M.T. (1999). Tobacco: production, chemistry and technology. Oxford, Blackwell Science.

Lucas G.B. et al. (1991). Compendium of Tabacco Diseases. St Paul: Minnesota : APS Press

Martin J.H., Leonard W.H. and Stamp D.L. (1976). Principles of Field Crop Production (3rd Education). McMillan Publications, Inc., N.Y.

Mattheus G.A. and Tunstall J.P. (1994). Insect Pests of Cotton. CAB International.

Nathan R. (1978). Fuels Fran sugar crops: systems, study for sugarcane, sweet sorghum and sugar beets. Technical Information Center U.S Departement of energy.

Shew H.D. and Lucas G.B. (1991). Compendium of tobacco diseases. APS Press, Minnesota, USA.

Smith W.C. and Cothren T.J. (1999). Cotton: origin, history, technology, and production. John Wiley & Sons.

Stewart J.M., Oosterhuis D., Heitholt J.J. and Mauney J.R. (2010). Physiology of Cotton. Springer-Verlag.

Ventobacco B. (1988). Η αποξήρανση των καπνών Virginia στην Ελλάδα. Εκδόσεις Αγροτεχνική.

Wrage L. (1999). Weed control in oilseed crops: Sunflower, safflower, canola and flax, Brooking S.D., South Dacota state University, College of Agriculture and Biological Sciences, US Dept. of Agriculture

Zehr U.B. (2010). Cotton: Biotechnological Advances. Springer-Verlag.

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	Undergraduate		
COURSE CODE:	610	**SEMESTER**	6th Spring
COURSE TITLE:	**AGROECOLOGY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratories	3+2=5	6	
COURSE TYPE:	Elective, Special Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG161/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course aims at introducing the students to the Ecology Science and familiarizing them with concepts such as: Environment Biotic and Abiotic Factors Ecological Organization Levels Agricultural Ecology and Conventional Agriculture Biodiversity Population increase Ecosystems Plant Ecology and Animal Ecology Upon completion of the course, the students are expected to know: the problems to the Agricultural Environment caused by the exercise of Conventional Agriculture the differences between the natural and the agricultural ecosystem the place of organisms in the ecosystem the biogeochemical cycles the interactions between plants and abiotic environment the interactions between plants and animals
Competencies
Decision-making Individual working Team working Development of new research ideas Be self aware and use sound judgment Respect to the natural environment

COURSE TOPICS and SCHEDULE

Introduction to the Agricultural Ecology Science Agriculture and Ecology Environment, biotic and abiotic factors Ecological Organization Levels The place of organisms in the Ecosystem Biogeochemical cycles Biodiversity Agroecology and conventional Agriculture Short, literature based, research projects

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of Information Technology during teaching and communication with the students: PowerPoint presentations. Student contact electronically and face-to-face in weekly office hours. Use of the electronic platform e-class (course web page).
METHODS OF INSTRUCTION	***Method*** | ***Semester workload*** Lectures | 39 Laboratory work | 26 Shelf-study | 78 ***Total workload in hours*** | ***143***
STUDENT LEARNING ASSESSMENT	Assessment language: Greek, English (ERASMUS) Assessment method: Written term exam that includes: - Multiple choice questions - Short answer questions Lab work evaluation: - Presentation of individual short research projects (100%)

SUGGESTED LITERATURE

Topic assignments refer students to the web for research and relevant literature

OVERVIEW

SCHOOL:	Agricultural Technology & Food Technology and Nutrition		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	611	**SEMESTER**	6th
COURSE TITLE:	**ORGANIC FARMING**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Practical Courses	3+2=5	6	
COURSE TYPE:	Agricultural Science		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	No		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG145/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The certain courses objective is to give students the basic principles of Organic Farming. Courses are focusing in the fields: Soil Management Transplanting Irrigation Management Pathogens & Pest Management Weed Control Social & Environmental Issues Sustainable Agriculture The practical courses learn to the students how to manage an agricultural farm with Organic way of production.
Competencies
Decision-making Autonomous working Collaborative working Advancement of a free, productive and inductive mind

COURSE TOPICS and SCHEDULE

Topics
01. Managing Soil Health
02. Garden and Field Tillage and Cultivation
03. Propagating Crops from Seed, and Greenhouse Management
04. Transplanting and Direct Seeding
05. Irrigation–Principles and Practices
06. Selecting and Using Cover Crops
07. Making and Using Compost
08. Arthropod Pest Management
09. Managing Plant Pathogens

10. Managing Weeds
11. Reading and Interpreting Soil Test Reports
12. Social and Environmental Issues in Agriculture
13. Sustainable Agriculture and Sustainable Food Systems

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	

Method	***Semester workload***
Lectures	39
Practice	26
The lectures are available to the students in e-class platform.	65
Shelf-study	78
Total workload in hours	***143***

STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek Method of Assessment: Optional Exams for the students during semester Written term exam that includes: - Multiple choice questions - Short answer questions In practical courses the students take exams in every course and have the opportunity to evaluate their performance.

TEXTBOOK and OPTIONAL READING

TEXTBOOK

Book [ISBN 978-0-9828781-0-1]: Teaching Organic Farming & Gardening. University of California, Santa Cruz. pp: 1-704. Edited by Martha Brown, Jan Perez, and Albie Miles, 2003. http://casfs.ucsc.edu/about/publications/Teaching-Organic-Farming/PDF-downloads/TOFG-all.pdf

OPTIONAL READING

Dent, D.R. and Walton, M.P., 1997. Methods in ecological & agricultural entomology. Cab International, London, Washington.
Katsoyannos, P., 1996. Integrated Insect Pest Management for citrus in northern Mediterranean countries. Benaki Phytopathological Institute.
Jervis, M. and Kidd N., 1997. Insect Natural Enemies: Practical approaches to their study and evaluation. Chapman Hall, London, New York, Tokyo, Melbourne.
Stathas, G.J., 2000. Rhyzobius lophanthae Prey consumption and Fecundity. Phytoparasitica, 28 (3): 203-211.
Stathas, G.J., 2000. The effect of temperature on the development of the predator Rhyzobius lophanthae and its phenology in Geece. BioControl, 45: 439-451.

Stathas, G.J., Eliopoulos, P.A., Kontodimas, D.C. and Giannopapas, J., 2001. Parameters of reproductive activity in females of Harmonia axyridis (Coleoptera : Coccinellidae). European Journal of Entomology, 98 (4): 547-549.

RENEWABLE ENERGY SOURCES

ELECTIVE COURSE GROUP 3

GENERAL

SCHOOL	AGRICULTURAL TECHNOLOGY & FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT	AGRICULTURAL TECHNOLOGY		
EDUCATION LEVEL	Undergraduate		
COURSE CODE	**706**	**SEMESTER**	AUTUMN - 7th
COURSE TITLE	**OLIVE TREE FARMING**		

COURSE COMPONENTS	**WEEKLY LECTURE HOURS**	**CREDITS**
Theory	3	
Laboratory	2	
Total	5	6,0

TYPE OF COURSE:	Special Infrastructure Elective Compulsory Course
PREREQUISITES:	None
TEACHING and ASSESSMENT EXAMINATION LANGUAGE:	Greek Greek
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes (in English)
ONLINE COURSE PAGE (URL)	

SKILLS DEVELOPMENT

Course Description and Learning Objectives

The course aims to provide students with the necessary knowledge to design and manage the production of quality olive oil.

Competencies

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

- Plan cultivation interventions for the production of healthy olive fruit
- Manage post-harvest handling to ensure the production of quality olive oil
- Consult on promotion and trade issues of olive oil

COURSE TOPICS AND SCHEDULE

Theory

- The role of olive oil in the Mediterranean Diet and human health
- The cultivation of the olive tree and the economic importance of olive oil production in Greece and worldwide
- Cultivation methods of the olive tree
- Post-harvest handling of olive fruit for the production of high quality olive oil
- Sensory analysis of olive oil
- Legislation concerning olive oil trade

Laboratory Work

- Cultivation methods of the olive tree
- Olive fruit management for the production of olive oil
- Basic chemical analyses for the quality control of olive oil

- Sensory analysis of olive oil

TEACHING and LEARNING METHODS - ASSESSMENT

COURSE STRUCTURE	Theory: auditorium lectures for all students. Laboratory Work: laboratory exercises for students in small groups.
USAGE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Audiovisual teaching methods, training at the Kalamata Olive Oil Taste Laboratory, teaching support through e-class learning platform
TEACHING PLAN	

COMPONENT	***Semester Workload***
Theory	39
Laboratory	26
Study	78
Course Total	***143***

STUDENT ASSESSMENT	Greek (English) Theory: final written multiple choice or essay examination (100% of final grade) Laboratory Work: final written examination including multiple choice (60% of final grade) and problem solving questions (40% of final grade)

5. RECOMMENDED READING

- Boskou D. Olive oil–Constituents, Quality, Health Properties and Bioconversions, 2012.
- Peri, C. (Ed.), The Extra Virgin Olive Oil Handbook, 2014

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	707	**SEMESTER**	7th (winter)
COURSE TITLE:	**MATHEMATICS FOR THE LIFE SCIENCES II**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Lab Exercises	3+2=5	6	
COURSE TYPE:	Special Infrastructure Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course objective is to give students the necessary knowledge on deterministic and probabilistic methods for solving problems in the field of biological and agronomic sciences emphasizing the increasing importance of quantitative techniques in scientific research. Upon successful completion of this course, students will be able to demonstrate an understanding of: Using the following mathematical tools: Biological Modeling, Single variable Calculus, Difference equations, Differential Equations, Develop discrete and continuous models of biological systems using the following techniques: Linear algebra, Difference equations, Differential equations,
Competencies
Decision-making Autonomous working Collaborative working Advancement of a free, productive and inductive mind

COURSE TOPICS and SCHEDULE

Introduction and overview of mathematical tools that will be used in class. Linear Algebra Dynamical systems Difference equations Differential equations

Stability in Dynamical Systems System Models in continuous time System Models in discrete time Chaotic system behavior

TEACHING AND LEARNING METHODS - ASSESMENT

TEACHING METHOD	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The teaching and learning process is supported by the electronic platform of e-class
METHODS OF INSTRUCTION	***Method*** / ***Semester workload*** Lectures: 39 Labs: 26 Shelf-study: 78 ***Total workload in hours***: ***143***
STUDENT LEARNING ASSESSMENT	Language of Assessment: Greek, English (ERASMUS) Method of Assessment: Written term exam that includes: - Multiple choice questions - Problem Solving

TEXTBOOK and OPTIONAL READING

Textbooks:

Bodine, Erin N., Lenhart, Suzanne, Gross, Louis J. (2014), Mathematics for the Life Sciences, Princeton University Press, ISBN: 9780691150727

Ledder Glenn (2013), Mathematics for the Life Sciences, Springer-Verlag New York, ISBN: 9781461472759

Istas Jacques (2005), Mathematical Modeling for the Life Sciences, Springer-Verlag Berlin and Heidelberg GmbH & Co. KG, ISBN: 9783540253051

David Logan & William Wolesensky, Mathematical Methods in Biology, Wiley-Blackwell, Sep 2009

L. Edelstein-Keshet (1988) Mathematical models in biology. McGraw-Hill Education, ISBN 0075549506.

C. Neuhauser (2003) Calculus for biology and medicine. Prentice Hall, ISBN 0131234412.

S. P. Ellner & J. Guckenheimer (2006) Dynamic models in biology. Princeton University Press, ISBN-10: 0691125899.

AGRICULTURAL INDUSTRIES

PLANT PROTECTION-DISEASE DIAGNOSIS

OVERVIEW

SCHOOL:	AGRICULTURAL TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION		
DEPARTMENT:	AGRICULTURAL TECHNOLOGY		
COURSE LEVEL:	*Undergraduate*		
COURSE CODE:	710	**SEMESTER**	7ο
COURSE TITLE:	**SEED PRODUCTION TECHNOLOGY**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratory Exercises	3+2=5	6	
COURSE TYPE:	Special Infrastructure course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The course aims to provide students with the necessary knowledge to understand the modern production process of plant propagating material, especially in the field crops. At the end of the course, the optimally-successful student should be able to: 1. perform seed sampling 2. understand how to identify plant varieties 3. apply appropriate methods for assessing the quality characteristics of the seeds (water content, purity analysis, germination analysis, seed vitality tests) and the vegetative reproductive organs (physiological age of potato seed tuber) 4. apply the appropriate cultivation techniques (seed-planting distances, fertilization, irrigation, crop protection, harvesting) for the production of plant propagating material 5. apply modern techniques (micropropagation, seedling production in aeroponic or hydroponic floating system) for the production of plant propagating material 6. store plant propagating material 7. implement techniques and treatments (post-harvest) to improve seed germination 8. understand the mechanisms affecting seed production in self-pollinated and cross-pollinated plants
Competencies
Adapt to new situations Decision making Autonomous working Team working Work in an interdisciplinary environment Respect to the natural environment Work in an international environment

Develop new research ideas

COURSE TOPICS and SCHEDULE

Contribution of seed production in the development of agriculture
The status of seed production in Greece
Structure, growth and chemical composition of the seeds
Physiology of seed germination
Factors affecting the production and storage of seeds
Production of certified seeds of field crops
Identification of plant varieties; seed cleaning, seed sampling
Identification of quality characteristics of seeds (seed moisture, purity analysis, weight of 1000 seeds etc.)
Seed germination test and determination of seed vitality
Seed production of self-pollinated field crops
Seed production of cross-pollinated field crops
Production of potato seed tuber
Production of vegetative propagating material with modern techniques: micro-plants, micropropagation and seedling production in hydroponic floating and aeroponic system

TEACHING AND LEARNING METHODS - ASSESMENT

<table>
<tr><td>TEACHING METHOD</td><td>In class and in laboratory, open field, greenhouse</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>The teaching and learning process is supported by the electronic platform of e-class</td></tr>
<tr><td>METHODS OF INSTRUCTION</td><td>
<table>
<tr><th>Method</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>39</td></tr>
<tr><td>Laboratory Exercises</td><td>26</td></tr>
<tr><td>Shelf-study</td><td>78</td></tr>
<tr><td>Total workload in hours</td><td>143</td></tr>
</table>
</td></tr>
<tr><td>STUDENT LEARNING ASSESMENT</td><td>Language of Assessment: Greek, English (ERASMUS)
Method of Assessment:
I. Theoretical part of the course:
Written term exam that includes development, short answer multiple choice questions or/and coursework.
II. Laboratory part of the course:
Written examination or laboratory work at the end of a laboratory exercise or a group of laboratory exercises.</td></tr>
</table>

TEXTBOOK and OPTIONAL READING

OPTIONAL READING

Basra A.S. (2006). Handbook of Seed Science and Technology. Food Products

Press.
Benkeblia N., Alexopoulos A.A. and Passam H.C. (2008). Physiological and biochemical regulation of dormancy and sprouting in potato tubers (Solanum tuberosum L.). Fruit, Vegetable and Cereal Science and Biotechnology vol. 2 Special Issue 1 2008 (2008: International Year of the Potato): 55-68.
Gamborg O.L. and Phillips G.C. (1995). Plant Cell, Tissue and Organ Culture - Fundamental Methods. Springer.
George F.E (1993). Plant Propagation by Tissue Culture Part 2: In practice. Exegetics Ltd., Edington, Wilts, England.
George F.E. (1993). Plant Propagation by Tissue Culture Part 1: The technology. Exegetics Ltd., Edington, Wilts, England.
Harris P. (1992). The Potato Crop – the scientific basis for improvement. Chapman & Hall, London.
Hartmann H.T., Kester D.E., Davies Jr.F.T. and Geneve R.L. (1997). Plant propagation: principles and practices (6th ed). Prentice Hall.
Hayward Bosemark N.O and Romagossa J. (1993). Plant Breeding. Principles and prospects. Chapman & Hall, London.
Hebblethwaite P.D. (1980). Seed Production. Butterworths. London.
Hutchins D. and Reeves J.C. (1997). Seed health testing. Progress towards the 21st century. CAB International. Wallingford.
Passam H.C. and Alexopoulos A.A. (2011). Physiology of dormancy. In: The Science of Horticulture – Vol 2 (K.V. Peter, ed.). New India Publishing Agency, New Delhi, India. pp. 89-117.
Stafford A. and Warren G. (1996). Plant Cell and Tissue Culture. John Wiley & Sons.
Struik P.C. and Wiersema S.G. (1999). Seed Potato Technology. Wageningen Press, Wageningen, The Netherlands.
Torres K. C. (1989). Tissue Culture Techniques for Horticultural Crops. Chapman & Hall.

OVERVIEW

SCHOOL:	Agricultural Technology and Food Technology and Nutrition		
DEPARTMENT:	Agricultural Technology		
COURSE LEVEL:	Undergraduate		
COURSE CODE:	711	**SEMESTER**	7h Fall
COURSE TITLE:	**IRRIGATION OF THE MOST IMPORTANT CROPS – LANDSCAPE IRRIGATION**		
TEACHING METHODS:	**TEACHING HOURS (WEEKLY)**	**ECTS CREDITS**	
Lectures and Laboratories	3+2=5	6	
COURSE TYPE:	Elective Course		
COURSE PREREQUISITES:	None		
TEACHING LANGUAGE:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS:	Yes (in English)		
COURSE WEB PAGE (URL)	http://www.eclass.teipel.gr/eclass2/courses/TTG167/		

SKILL DEVELOPMENT

Course Description and Learning Objectives
The lesson of "Irrigation of the most important crops – landscape irrigation" is an elective course lesson, necessary for the students regardless the specialty chosen. The purpose of the lesson is by fulfilling their obligations, the students will be able to install, use and repair an irrigation network, by using all the irrigation components, for its function and its control in a greenhouse, field or (and) in a landscape work. The above will be achieved by the application / utilization of the knowledge given in combination with the learning of searching and finding the current trends in the Irrigation field for a number of demanding crops such as greenhouse crops, graminaceous, forage or (and) the landscape works. Individually, the aims of the lesson are for the students to be able to: • Choose and install the proper irrigation system for seedling production / grafts production, • Choose and install the proper irrigation and fertigation system, for crops of economic importance such as greenhouse crops, graminaceous, forage crops and at a landscape work • Choose and install a drainage system in some special cases such as greenhouse drainage network; case studies in the field and at a landscape work. The knowledge acquired by the completion of their obligations, are of level 6 and they form the advanced knowledge in the field of work which in turn means critical understanding of the theory and the principles of irrigation.
Competencies
Decision making Working individually Team working Work in an international environment Project design and management

Be self-aware and use sound judgment
Promotion of free, creative and inductive thinking

COURSE TOPICS and SCHEDULE

Lecturing modules

Pressure irrigation networks for the production of seedlings, grafts, ornamental plants,
Irrigation schedules and controls during the production of seedlings, grafts, ornamental plants,
Pressure irrigation networks for the production of field crops of economic importance for Greece
Irrigation schedules and controls of field crops of economic importance for Greece
Pressure irrigation networks used in landscape architecture
Irrigation schedules and controls used in landscape irrigation
Irrigation networks of greenhouses, selection of the proper system, applications in the most common greenhouse crops, control of irrigation parameters
Fertigation of crops,
Drainage in the greenhouse
Drainage in the field and in landscape cases

Laboratory and practical application:

Fertigation systems
Parts and hardware used for the installation of the irrigation systems for seedling, grafts and ornamental plants production. Control points and automations,
Making an irrigation schedule for
Greenhouse crops and various constructions for plant propagation
Field crops of economic importance for Greece
Landscape applications
Installation of sprinkler irrigation (parameters, materials and procedures) in
Greenhouse crops and various constructions for plant propagation
Field crops of economic importance
Landscape applications
Installation of drip irrigation (parameters, materials and procedures) in
Greenhouse crops and various constructions for plant propagation
Field crops of economic importance
Landscape applications
Drainage procedures for case studies for covered crops, in the field and in landscaping

TEACHING AND LEARNING METHODS - ASSESSMENT

TEACHING METHOD	Lectures in class and field studies	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Power point presentations during lectures and practice and self-assessment test in the Blackboard. Potential use of e-class for homework.	
METHODS OF INSTRUCTION	***Method***	***Semester workload***
	Lectures	39
	Laboratory work	26

	Shelf-study	78
	Total workload in hours	***143***
STUDENT LEARNING ASSESSMENT	Assessment language: Greek, English (ERASMUS) Assessment method: The examination of the Lecture is comprised of Multiple Choice, Questions for Short Answers, and Written Exercises (via e-class). The written exercises, will count up to 20% of the final grade. Potentially, the examination can be oral, only in obligatory cases. The examination in Laboratory is comprised of Multiple Choice Questions, and Problem Solving. The evaluation of the students will take place after finishing each Learning Section. The final grade will be the average of the grades from each section. Potentially, the examination can be oral, only in obligatory cases.	

SUGGESTED LITERATURE

TEXTBOOK

Pete Melby, Simplified irrigation design 2nd edition, Wiley 1995

OPTIONAL READING

H.W.,Belcher, Frank M.,D'Itri, Subirrigation and Controlled Drainage, Taylor & Francis Ltd, 1994

M. G.,Bos, M.A.S.,Burton, D. J.,Molden, Irrigation and Drainage Performance Assessment, 2005

C.M. Burt, A Clemens, R. Bliesner, J.L. Merriam, L. Hardy, Selection of Irrigation Methods for Agriculture, American Society of Civil Engineers, 2000

B. A. Stewart and D. R. Nielsen, co-editors, Irrigation of agricultural crops No 30 in the series Agronomy, American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Madison, Wisconsin USA, 1990

FAO: Irrigation Water Management: Training Manuals Nr. 1-11, Food Agricultural Organization

Freddie R. Lamm, James E. Ayars, Francis S. Nakayama, Microirrigation for Crop Production, Elsevier, 2007