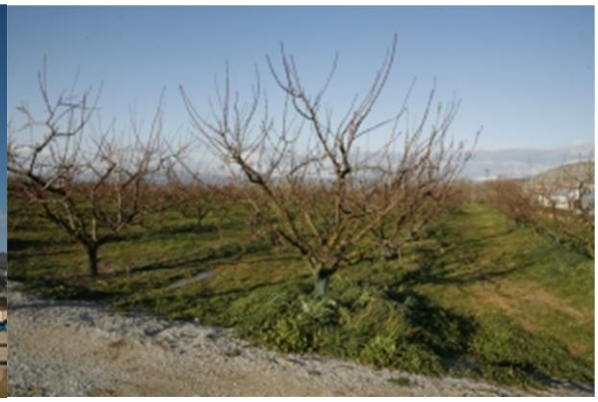
UNIVERSITY OF THESSALY
SCHOOL OF AGRICULTURAL SCIENCES

Department of Agriculture Crop Production and Rural Environment

Student Guide


Academic Year 2023-2024

UNIVERSITY OF THESSALY
SCHOOL OF AGRICULTURAL SCIENCE

DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT

STUDENT GUIDE

ECTS
European Credit Transfer System

ERASMUSplus
European Community Action Scheme for the Mobility of University Students

Academic Year 2023-2024

Volos

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GENERAL INTRODUCTION

THE ECTS AND THE UNIVERSITY OF THESSALY

The information in this guide aims at helping foreign students to prepare for their studies in the Department of Agriculture, Crop Production and Rural Environment, University of Thessaly, Greece.

Student mobility encourages cooperation between Universities and constitutes an essential activity for the improvement of the quality of Higher Education in the European Union. It is also important in shaping student academic and professional careers, since it helps students become acquainted with the ideas, languages and civilizations of the member states. This has been clearly shown by the Erasmus Program.

In 1989, the European Credit Transfer System (ECTS) was developed and established in all European Union countries. It was initially designed for the mutual recognition of academic studies abroad, among the Universities of the community member states. It consisted of a system of credit units allocated to studies carried out in a foreign country. The credit units were then accepted and recognized by the home Universities. This facilitated the mobility of students among the member states and improved the quality of European education. Today, the ECTS has further evolved into a system helping the European Universities organize and improve their curricula, so as to reach common standards. It encourages Universities to adopt same units and grades throughout Europe, in a transparent way, linking the European Universities into a common Higher Education network. The ECTS increases student choices concerning education and also makes studies in Europe more attractive to students from other continents.

THE ECTS CHARACTERISTICS

In the ECTS, 60 credit units represent the workload of a full-time academic year. As “workload” we define the time required by an average student to complete all his/her study requirements, including lecture attendance, seminars, laboratory training, essay writing, and preparation for the examinations. These 60 credit units are distributed among all courses of the curriculum, in a way representing the workload required for the completion of each of them, and they reflect the contribution of each course to the total amount of work required by that particular course within one academic year. The units are credited to the student only after the successful completion of all work required from him/her. The units quantify the level of knowledge and the skills obtained by the student in order to complete the scientific tasks for his/her graduation.

In most European Universities, the Study Programs consist of 36-40 weeks per year, or 18-20 weeks per semester. Given that this represents 60 ECTS credit units, each unit corresponds to 0.6-0.66 weeks of studies. Also, a single course taught in a semester usually has a workload of 4 hours of lectures and lab training per week, or 52 hours per semester, plus approximately another 50-100 hours of additional combined work (essays,

examinations) per semester. To such a typical course 6 credit units are usually allocated. The credit system assures that a reasonable amount of work is to be assigned to a student during his/her study period abroad. If a visiting student attends courses, from which he/she obtains 120 credit units in a single academic year, this indicates that he/she has worked twice as hard as an average local student. Similarly, if a student attends a reduced workload program of 30 credit units per year, he/she will have half the credit input of a full-time student. It is also possible for a visiting student to move to another host Institution, provided that the first host Institution consents to these movements and that the student has the suitable qualifications required by the new host Institution. The record of the student's academic achievements and qualifications obtained from the previous curriculum helps the host Institutions to decide on this matter.

The structure and content of the curricula are not dictated by the ECTS, but are decided by the Institutions themselves, so that the level and quality of the provided training may be appropriate for cooperation agreements between such Institutions. The ECTS provides transparency to the quality level of education of each Institution, so as to facilitate the mutual recognition of the equivalency of the studies among various Universities. Even when the curricula of two Institutions are at a different level, the ECTS serves as a measure of evaluating this difference, so that a certain study period in one Institution may be quantitatively equated to a certain study period in another.

Institutions participating in the ECTS must have a complete list of offered courses, including those leading to a PhD degree. Exchange students will have the opportunity to select from, and attend to, the regular curriculum courses, and not special courses designed for them alone, unless the exchange students are specifically excluded from the obligation to comply with the requirements for obtaining degree in that University.

The ECTS coordinators are in charge of all required administrative and academic issues of certifying the fully or partially completed academic studies abroad. In the ECTS, the grade scale is as follows.

Grade scale		
A	excellent	10
B	very good	8-9
C	good	7
D	satisfactory	6
E	sufficient	5
Fx	failure	4
F	failure	0-3

The adoption and use of the ECTS by Higher Education Institutions is voluntary and is based on the mutual trust among Universities concerning their academic quality. Each Institution chooses its own cooperating partners.

In addition to the credit unit system, the ECTS makes information on academic curricula and on student performance amply available to all interested parties. The ECTS also facilitates the agreements between students and host Institutions, as well as between the cooperating Institutions. To each of the above academic ECTS attributes, there corresponds a relevant document. For example, the Study Certificate corresponds to the credit system. For the curricula and student performance information, an information package is filled in and used. Also, for the agreements between Institutions and students an Application-Agreement Form is filled in.

In conclusion, the ECTS assures the transparency of the quality of the offered studies by the following means:

1. The 60 credit units for each academic year are distributed among the courses in a way that quantifies the workload of each course, including the number of lectures, seminars, laboratory training, homework and examinations.
2. The ECTS makes information concerning the structure and the curricula of host Higher Education Institutions available to interested students and academics.
3. The Study Certificate describes the level of academic knowledge acquired by the exchange student, in a coherent, tangible and measurable way. The Study Certificate can then be easily evaluated and utilized by the cooperating Institutions.
4. The ECTS Training Agreement between cooperating Institutions and students gives to the students precise information about courses and other academic training and cites the units allocated to them after the satisfactory completion of the courses.

A. THE UNIVERSITY

A.1 ADDRESS OF THE UNIVERSITY

University of Thessaly, Argonafton and Fillelinon, 38221 Volos - Greece

Tel. center: + 3024210 74000

Web site: http://www.uth.gr

A.2 UNIVERSITY ADMINISTRATION

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A.3 INSTITUTIONAL COORDINATOR FOR THE ERASMUS plus PROGRAM

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Institutional ERASMUS+ Coordinator

Erasmus Office (Volos)

International Relations Office e-mail (Volos): irep@uth.gr

Fax: +30 24210 74603

Address: Argonafton & Filellinon, 382 21 Volos (Papastratos Building, University of Thessaly - Seafront Complex, 1st floor, Office No 7)

Penelopi Dalli

ERASMUS+ Administrative Coordinator

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A.4 GENERAL DESCRIPTION OF THE UNIVERSITY

The University of Thessaly was founded in 1984 and its central administration offices are located in Volos. As with all Greek Institutes of Higher Education, the University of Thessaly is a Public-Sector entity and has complete administrative autonomy. It is, however, supervised from, and subsidized by, the Greek State through the Ministry of Culture, Education and Religious Affairs.

Staff

The University staff consists of:

1. The Teaching and Research Staff (T.R.S.). Members of T.R.S. belong to four levels: i) Professor, ii) Associate Professor, iii) Assistant Professor, iv) Lecturer.
2. The Visiting and Special Scientists (V.S.S.), according to the Presidential Law Nr. 407/1980.
3. The Laboratory Teaching Staff (L.T.S.).
4. The Special Technical Laboratory Staff (S.T.L.S.).
5. The Administrative personnel.

Students

In the University there are under- and postgraduate students. Undergraduate students are those who enroll in the Study Programs of the various Departments. Postgraduate students are of two groups:

1. those enrolled in the existing Postgraduate Study Programs in the various Departments and
2. those accepted as Ph.D. candidates.

SCHOOLS - DEPARTMENTS

The University of Thessaly, located at five main cities of central Greece: Volos, Larissa, Karditsa Trikala and Lamia, is organized into the following Schools and Departments:

School of Engineering

Department of Architecture Engineering (Volos)

Department of Civil Engineering (Volos)

Department of Mechanical Engineering (Volos)

Department of Planning and Regional Development (Volos)

Department of Electrical and Computer Engineering (Volos)

School of Humanities and Social Sciences

Department of Primary Education (Volos)

Department of Early Childhood Education (Volos)

Department of Special Education (Volos)

Department of History, Archaeology and Social Anthropology (Volos)

Department of Culture, Creative Media and Industries (Volos)

Department of Language and Intercultural Studies (Volos)

School of Agricultural Sciences

Department of Agriculture Crop Production and Rural Environment (Volos)

Department of Ichthyology and Aquatic Environment (Volos)

Department of Agrotechnology (Larisa)

Department of Animal Science (Larisa)

Department of Food Science and Human Nutrition (Karditsa)

School of Health Sciences

School of Medicine (Larisa)

Department of Biochemistry and Biotechnology (Larisa)

Faculty of Nursing (Larisa)

Faculty of Public and Integrated Health (Karditsa)

Department of Physiotherapy (Lamia)

Faculty of Veterinary Science (Karditsa)

School of Technology (Larisa)

Department of Power Systems (Larisa)

Department of Environment (Larisa)

Department of Digital Systems (Larisa)

Department of Forestry, Wood Sciences and Design (Karditsa)

School of Ecnomomics and Business (Larisa)

Department of Economics (Volos)

Department of Accounting and Finance (Larisa)

School of Physical Education and Sport Science (Trikala)

Department of Physical Education and Sport Science (Trikala)

Department of Nutrition and Dietetics (Trikala)

School of Science (Lamia)

Department of Computer Science and Biomedical Informatics (Lamia)

Department of Computer Science (Lamia)

Department of Physics (Lamia)

Department of Mathematics (Lamia)

A.5 ACADEMIC CALENDAR

- ✔ Fall Semester: 16 October 2023 – 26 January 2024
- ✔ Spring Semester: 19 February 2024 – 7 June 2024

A.6 THE UNIVERSITY LIBRARY

Library Collection and Statistics

The Library collection consists of about 80,000 volumes of books (in open bookstands) and 778 international and 50 Greek journal subscriptions. Also, there is a large collection of topographic, geological and soil maps and an increasing collection of audio-visual material. The material is distributed among the six library branches, located in Volos, Larissa, Trikala, Karditsa and Lamia. The number of library visitors is c. 300 per day, while the daily circulation rate of the library material is close to 200 items.

Library Registration Procedure

The library material and facilities are available for all members of the University community, by interested researchers and scholars, as well as by members of the general public. To use the library, a library ID must be obtained by filling out the appropriate application form at any library branch. Library user ID holders can borrow material from any library branch. When applying for a library ID, the applicants are assumed to have become aware of all library regulations.

Library Electronic Network

The GEAC-ADVANCE library network has been installed since early 1994. The acquisition and installation of the system was funded by the STRIDE project of the European Community. The system was then upgraded with the funding by the EPEAEK project. The library network links all its branches to the Central Library SUN ULTRA 2 main computer.

The Library Catalogue

The University Library uses the Decimal Dewey Classification system (versions DDC20 and DDC21) and all its collections are included in the GEAC-ADVANCE system. The catalogue can be searched from the PC terminals located at any library branches using the OPAC search engine. The catalogue can be accessed by author name, title, ISBN or ISSN, Dewey number, subject or by keyword search. Assistance to catalogue search is also kindly provided by the librarians upon request.

TERM-TIME OPENING HOURS

Library	Monday-Friday
Central Library	8:15-20:00
Library Branches	
School of Agricultural Sciences	8:00-15:00
Faculty of Medicine	8:15-20:00
Department of Physical Education and Sport Science	8:00-18:00 (Friday: 8:00-16:00)
Faculty of Veterinary Science	8:00-20:00
Department of Veterinary Science	08:00-15:30
School of Science	8:00-15:30
Kitsos Makris Folklore Centre	8:00-15:00
Library website: www.lib.uth.gr	

Addresses and Telephone numbers

Central Library

Address: 2 Metamorfoseos Str, 38333 Volos

Tel.: +302421006338, +302421006335

Fax: +302421074851

e-mail: clib@uth.gr

Library Branch: School of Agricultural Sciences

Address: Fytokou Str., 38446, N. Ionia of Magnesia

Tel: +302421093141

Fax: +302421093144

A.7 COMPUTER FACILITIES

Exchange students may have access to Internet during their study period, in rooms fully equipped with computers, where students can work.

B. GENERAL PRACTICAL INFORMATION

B.1 REGISTRATION PROCEDURES

The documents required by and submitted to the Secretary of the Department, for the registration of exchange students, are 4 passport-size photographs and a valid passport or identity card. No tuition for the studies and no registration fees are required.

The submitted documents by the exchange students (application form, learning agreement, analytical chart of grades), must be properly filled in and signed, and are then processed by the personnel of the International Relations Office before the end of June of each year. Any delays beyond this time may lead to the cancellation of the exchange. Upon arrival, students should contact the International Relations Office (Papastratos Administration Building, 1st floor).

B.2 RESIDENCE PERMIT

EU country students who intent to stay in Greece for more than three months are required to apply for a Residence Permit to the Foreigners' Department in Volos. (tel: 24210-39030, Rozou & G. Kartali Street), where they must submit:

- ✔ 3 passport-size photographs
- ✔ a valid passport
- ✔ a student identification card
- ✔ an E128 health insurance certificate
- ✔ a foreign exchange receipt (pink slip), obtained from the bank where the student has opened an account
- ✔ a certificate from the Department Secretary certifying that the student is registered as exchange student
- ✔ a health certificate (only for those who intend to stay for more than six months) obtained from the Primary Health Committee of the Volos Prefecture (135 Defteras Noemvriou Street, tel. 24210-

23718). This certificate is issued by the Committee, by submitting a recent chest x-ray radiograph and a blood analysis results slip.

Students from non-EU countries are advised to contact the Greek Embassy or Consulate in their country before their departure, to check if a student visa is required.

B.3 ACCESSING THE UNIVERSITY

Volos is at a distance of 320 km from Athens and 210 km from Thessaloniki. There is a regular bus service, >6 times a day from Athens and >4 times a day from Thessaloniki (bus information on tel: 24210-25527). Also, there are regular bus services from/to other cities of Greece, and from/to the rest of Thessaly. There are also regular train and Intercity train services 7 times a day from Athens and Thessaloniki through Larissa (train information on tel: 24210-24056). Also, there are regular local train services, linking Volos to the neighboring city of Larissa.

B.4 COST OF LIVING

The living cost is estimated to approximately 750 €.

B.5 ACCOMODATION

Exchange students are expected to search for their own accommodation, but the International Relations Office could also assist them in their search. Rent in Volos may range between 200 and 300 Euros per month for a studio flat, utility charges not included.

B.6 CATERING

The University Meal Service supplies exchange students (upon submitting a photograph, along with an application form) with a card, with which they may have access to the two University restaurants (the first one at Defteras Noemvriou Street, the second one inside the School of Agricultural Sciences). The restaurants are open thought out the year, except for the Christmas and Easter vacation periods, as well as the summer vacation period (July 1st to August 31st)

Catering hours:

Breakfast: 08.00 - 09.00

Lunch: 12.30 - 15.30

Dinner: 18.00 - 20.30

B.7 STUDENT TRANSPORT GUIDE

A Student Transportation Card (valid for the entire academic year) may be applied for, and is issued by, the Department Secretary, after submitting a passport photograph. A travel fair reduction of 50% is provided for local transportation, where the host Department is located and for commuting to and from the student's residence. There is a 25% fair reduction when the card is used for transportation to other areas of the country.

B.8 HEALTH AND MEDICAL INSURANCE

Students coming from EU countries must have with them the E111 or E128 certificates. All EU countries provide this certificate. However, in case this is not possible, the University offers full free medical care to all students, including medication and hospital treatment. To have access to these services, students should have a Medical Booklet, which can be issued by the Department Secretary after submitting a passport photograph.

B.9 SPORT AND OTHER ACTIVITIES IN VOLOS

Some of the many important artistic, athletic and civic recommended events and places to visit in Volos are as follows:

1. The Archaeological Museum, with paleolithic, neolithic, archaic and Byzantine expositions. Working hours: Everyday 08.30-14.00, Mondays closed (tel.: 24210-36987).
2. Archaeological sites to visit: a) The neolithic settlement at Dimini, b) The neolithic settlement at Sesklo, c) The ancient theater of Dimitriada.
3. The Kitsos Makris Folklore Center, with a collection of books, paintings and everyday folklore house items (tel.: 24210-37119).
4. The "Giorgio de Chirico" Center of Modern Arts, with permanent and periodic modern art exhibitions (tel.: 24210-31701).
5. The Municipal Gallery, belonging to the painter «Zogia» (tel.: 24210-30713).
6. The Municipal Peripheral Theater (tel.: 24210-32818).
7. The Municipal Conservatoir (tel.: 24210-39594).
8. The year-round indoor cinemas: a) Village 4 Cinemas (tel: 24210-94600).
9. The open-air summer cinema "Exoraistiki" (tel.: 24210-30303).
10. Libraries: 1) Public Library (tel.: 24210-59000), 2) Municipal Library (tel.: 24210-25363), 3) The "Three Hierarchs" Library (tel.: 24210-25641), 4) The Municipal Historical Archive (at Spirer Building, tel.: 24210-39644).

11. The sports centers, covering a variety of sports. There are two Stadiums, football grounds, basketball pitches, tennis courts, as well as two indoor and an open-air swimming pool. Information at the Athletic Organization of Volos (tel.: 24210-71770-44268).

C. THE DEPARTMENT

C.1 NAME AND ADDRESS OF THE DEPARTMENT

SCHOOL OF AGRICULTURAL SCIENCES

DEPARTMENT OF AGRICULTURE, CROP PRODUCTION & RURAL ENVIRONMENT

Fytokou Str.-N.Ionia, 384 46 Volos

C.2 DEPARTMENT ADMINISTRATION

The Chair of the Department	**The Vice-Chair of the Department**
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Secretary

Athina Tolia

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C.3 GENERAL DESCRIPTION OF THE DEPARTMENT

The Department of Agriculture Crop Production and Rural Environment (previously named Department of Agriculture, Crop and Animal Science) was founded in 1984. The first 30 students were registered in the academic year 1988-1989. The Department buildings are located at Fytoko, Nea Ionia, Volos. The Department is an independent, self-administered establishment run by the Chair and Vice-Chair of the Department (both elected every two years by the Department members, and representatives of technical and teaching staff members and students) and by the Assembly of Department (consisting of academic staff, as well as representatives of technical and teaching staff members and students).

The Department of Agriculture Crop Production and Rural Environment cooperates closely with Universities and Institutions in Greece and abroad, by encouraging the exchange of academic staff and students, and by organizing joint meetings and research projects. The Department's academic curriculum aims at training

agronomists and agricultural scientists in the science and technology of plant production and rural environment. Some of the education keystones and research activities of the Department are a) sustainability in practice, by using environment-friendly techniques in plant production, b) advances in food safety and technology, during production and processing, and c) integrated approaches in preservation of agro-ecosystems and sustainable agricultural production. Thus, the Department's academic profile covers a broad, unique and important area in biological sciences, relevant to agricultural engineering, agronomy, horticulture, landscape ecology and management, food safety and public health awareness and agricultural policy.

C.4 THE DEPARTMENT LABORATORIES

1. Laboratory of Genetics and Plant Breeding

Director: Ourania Pavli, Associate Professor

2. Laboratory of Agronomy and Applied Crop Physiology

Director: Nicholaos Danalatos, Professor

3. Laboratory of Weed Science

Director: Anestis Karkanis, Associate Professor

4. Laboratory of Entomology

Director: Nikolaos Papadopoulos, Professor

5. Laboratory of Agricultural Hydraulics

Director: Athanassios Sfougaris, Professor

6. Laboratory of Plant Pathology

Director: Evangelos Vellios, Associate Professor

7. Laboratory of Soil Science

Director: Vasileios Antoniadis, Associate Professor

8. Laboratory of Agricultural Construction and Environmental Control

Director: Nikolaos Katsoulas, Professor

9. Laboratory of Biometry

Director: Christos Nakas, Professor

10. Laboratory of Agricultural Machinery

Director: Athanassios Sfougaris, Professor

11. Laboratory of Pomology

Director: George Nanos, Professor

12. Laboratory of Plant Molecular Biology

Director: Panagiotis Madesis, Assistant Professor

13. Laboratory of Ecosystem and Biodiversity Management

Director: Athanassios Sfougaris, Professor

14. Analytical Chemistry and Pesticides Laboratory

Director: Nikolaos Tsiropoulos, Professor

15. Laboratory of Vegetable Production

Director: Spyridon Petropoulos, Associate Professor

16. Laboratory of Mineralogy- Petrology

Director: Athanassios Sfougaris, Professor

17. Laboratory of Food Technology, Quality Control and Food Safety

Director: Olga Gortzi, Professor

18. Laboratory of Agricultural Economics and Consumer Behaviour

Director: Georgios Vlontzos, Associate Professor

19. Laborotary of Viticulture

Director: Despoina Petoumenou, Assistant Professor

20. Laboratory of Floriculture and Landscape Architecture

Director: Christos Lykas, Associate Professor

Moreover, there are the following teaching and research facilities, functioning as **student training laboratories**:

A. Laboratory of Physics
B. Laboratory of Chemistry
C. Laboratory of Biology
D. Laboratory of Informatics

C.5 THE LIBRARY

Within the Department's main building there is a library that has a fully undated collection of books and Within the Department's main building there is a library that has a fully updated collection of books and journals for the use of students and the staff. The library was one of the first in Greece equipped with electronic catalogues. The library services (e.g. book lending and reservations) are fully connected with the network system of all other University library branches (including the Central Library in Volos, as well as the branches at the School of Agricultural Sciences - Volos, at Larissa, Karditsa, Trikala and Lamia). The Department encourages all its members to benefit from the library for their education and research. The main Library is open throughout the entire academic year every day, from 08.00 to 20.00, except for the summer vacation period (1/7-31/8). During this summer period, the library is open from 08.00 to 14.30. To use the library services, a "user card" is issued, the display of which permits the users to borrow library material. The user card is provided by all Library branches after filling in an application form. Under- and postgraduate students, as well as the University staff, can borrow up to 10 books for a 21- to 30-day period. The rest of the users and researchers may borrow up to 5 items for a 14-day period. All users have the right for a renewal period. The library collection consists of about 5,000 book titles. The total number of items, including multiple book copies, exceeds the 12,000 volumes and 200 journal titles, 99% of which are in English.

C.6 STAFF

C.6.1 Professors

✔ **Nicholaos Danalatos,** Dr.

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e-mail: kgiannoulis@uth.gr

✔ **Persefoni Maletsika, Dr.**

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e-mail: pmalets@uth.gr

✔ **Nikoletta Ntalli, Dr.**

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e-mail: nntalli@uth.gr

C.6.4 Laboratory Teaching Staff

1. **Anastasia Angelaki, Dr.**
(Agricultural Hydraulics with Emphasis in Soil Physics)

2. **Konstantinos Zarpas, Dr.**
(Entomology)

3. **Christos Cavalaris, Dr.**
(Agricultural Machinery and Crop Mechanization)

4. **Evlalia Koufostathi, M.Sc.**

5. **Evaggelini Kitta, Dr.**
(Agricultural Construction)

6. **Fevronia Lioliopoulou, Dr.**
(Plant Pathology)

7. **Dimitrios Bartzialis, Dr.**
(Agriculture, Sustainable Production of Traditional Arable Crops—Industrial and Energy Plants)

8. **Evangelia Panagiotaki, M.Sc.**

9. **Elpiniki Skoufogianni, Dr.**
(Agriculture—Winter Cereals, Legumes and Aromatic Plants)

C.6.5 Special Technical Laboratory Staff

1. **Christos Karamoutis, M.Sc.**
2. **Anna Karagianni**
3. **Niki Tomara**
4. **Spyridon Souipas, Dr.**
5. **Constantinos Christonis**

C.6.6 Administrative Staff

1. **Athina Tolia-Marioli**
2. **Eleni Topouzoglou, M.Sc.**
3. **Eleni Mantziou**
4. **Sofia Simopoulou**
5. **Athina Oikonomou**
6. **Christos Kanaliotis**

Information about

Department of Agriculture Crop Production and Rural Environment on website http://www.agr.uth.gr/en

C.7. CURRICULUM MANAGEMENT

The duration of studies in the Department of Agriculture, Crop Production and Rural Environment is five years (ten semesters), which are divided into three parts. The first part, semesters 1-4, is a broad introduction to the concepts of biological, technological, financial and social elements of agriculture. The second part, semesters 5-8, offers mandatory courses to build up the student specialization. The third part, semesters 9-10, consist of optional courses which are more specialized and the student can choose according to his/her fields of interest.

In each semester the curriculum includes 3 or 6 courses. Moreover, during the entire 5-year study period, the students attend a two-month summer period of practice, and they should also submit a thesis. The hours and credits corresponding to lectures, exercises, and laboratory hours for all taught courses in each semester are listed separately below.

C.7.1 E.C.T.S. Scores

ECTS Score	Definition	Local Grading System
A	excellent	10
B	very good	8-9
C	good	7
D	satisfactory	6
E	sufficient	5
Fx	failure	4
F	failure	0-3

C.7.2 Thesis

To get a degree from the Department of Agriculture, Crop Production and Rural Environment, the students have to submit and present a thesis based on research conducted as a complete experiment in a specific field. The thesis can also be a bibliographic search review essay. The thesis serves two main purposes: a) it helps the undergraduate student get acquainted with research work, and b) it allows the Department to develop research activities by using its own human resources. Students are free to choose a research field of their own interest, in consultation with the Department teaching staff. Every successful thesis is allocated 30 ECTS credit units in total. Each staff can accept up to 5 students per academic year. A thesis can be completed from two students, but the part of each student must be discrete.

C.7.3 Practice

From the 6th and up to the 10th semester, students are obliged to carry out their summer practice for a period of two months in public-sector authorities or in private enterprises in the country or abroad. The aim of this practice is for the students to become familiar with the subjects they have been taught in the classes and to get experience for their future profession. The practice may, alternatively, be divided between the summer time following both the 6th and the 8th semesters, or be part of an Erasmus mobility grant.

C.7.4 Postgraduate studies

There are currently three Postgraduate Study Programs offered:

1. The Postgraduate Program **"Sustainable Crop Production"**

The subject of this postgraduate program aims at the thorough scientific knowledge development and specialization of scientists on the subject of Sustainable and Viable Crop Production, including genetics and plant biotechnology, field crops, aromatic and medicinal plants, vegetables in the field and greenhouse, viticulture, and pomology.

The postgraduate program Sustainable and Viable Crop Production includes two semesters of studies, including 7 postgraduate courses and completion of an experimental thesis. The degree consists of 60 ECTS units, with 35 units obtained from the 7 courses and 25 units from the research thesis. Three winter courses are compulsory and 2 winter plus 2 spring courses are electives by the students in collaboration with the faculty member supervising their thesis.

COURSE TITLES PER SEMESTER

Winter semester

Compulsory

- Sustainable Crop Production
- Soil Fertility and Plant Nutrition
- Breeding for resistance against stress – Breeding for quality
- Seminar (no ECTS units): Agricultural Experimentation – Literature search and analysis – Scientific writing

Electives (2 courses from the following)

- Sustainable grapevine cultivation
- Pomology and Environment
- Cultivation of Biomass Crops for Energy Production

- Selection methods – Breeding for quantitative traits

Spring semester

Electives (2 courses from the following)

- Specific Issues on Viticulture
- Modern greenhouse vegetable crops cultivation
- Innovations in Pomology
- Management of Degraded Soils
- Cultivation of Aromatic and Medicinal Plants
- Crop Growth Modelling
- Molecular Improvement – Plant Biotechnology
- Advances in seed production and plant propagation technology

2. The Postgraduate Program "**Technologies and Management of Greenhouses and Greenhouse Crops**"

The subject of this Postgraduate program is the scientific training and specialization of scientists on the subject of technologies and management of greenhouses and greenhouses crops. The scope of the program is: a) the development of research in subjects of technologies and management of greenhouses, technicians, technologies and management of greenhouses crops and production of vegetative propagating material of floricultural and horticultural plants.

b) the development of specialized scientists able to undertake positions in public and private enterprises on the above covered scientific areas who would be capable to support the technological development of the area, to manage the modern equipment of greenhouses units and to contribute to competitive, high quality and safe products, production with environmentally friendly practices.

The postgraduate program **Technologies and Management of Greenhouses and Greenhouse Crops** involves three semesters of studies, including 7 postgraduate courses and completion of an experimental thesis. The degree consists of 60 ECTS units, with 45 units obtained from the 35 courses and 25 units from the thesis. The program has no tuition fees.

COURSE TITLES PER SEMESTER

1st Semester

- Functional responses and adaptations of crops under protected cultivation.
- Technologies for greenhouse and screenhouse control.
- Modern techniques for the management of ornamental crops and the production of propagating material.

- Modern cultivation systems for greenhouse vegetable production.

2nd Semester

- Soilless cultivation systems and technologies.
- Marketing of greenhouse products.
- Development of research plans.

3. The Postgraduate Program "**Phytoiatrics and Environment**" **(**http://fytiatriki.agr.uth.gr**)**.

The objectives of this program of postgraduate studies are, first and foremost, the promotion of scientific knowledge but also for the amplification of research as well the educational needs of the country in the field of Phytoiatrics and Environment. More specifically, this program aims to offer specialisation for new scientists in both the broad band of Phytoiatrics and the more defined partial sectors, aiming at the high level education of scientists capable of contributing to the agriculture growth of the country. In addition, the program of postgraduate studies also aims to develop an internationally high level of education which will appeal to students both here and abroad. The main reason to attend Phytoiatrics and Environment is to advance your career and increase your salary potential.

This program of Postgraduate Studies consists of eight (7) courses and a Master Thesis. The program is accredited according to the European Credit Transfer System (ECTS) and successful completion requires students to achieve a total of 60 ECTS credits (ECTS credits per course=5, ECTS credits of thesis=25). The expected time of completion is two (2) semesters, including the submission and presentation of the Thesis. The courses are offered in Greek language and the attendance is obligatory. The program has no tuition fees.

The courses and ECTS units corresponding to lectures, exercises, and laboratory hours for all courses in each semester are listed separately below.

1st Semester	
Courses	ECTS credits
Modern strategies and methods of insect pest control	5
Integrated plant disease management	5
Pesticides: fate in the environment and food, residue analysis	5
Weed management	5
Thesis	10
2nd Semester	
Courses	ECTS credits

Special topics in Phytiatrics	5
1st Elective course	5
2nd Elective course	5
Thesis	15
Elective courses	
Protocols and programs in plant protection	5
Principles and diagnostic methods of plant diseases	5
Insect ecology	5
Climate change – Biological invasions-Plant protection	5
Postharvest protection of agricultural products and food	5

In addition, our Department offers in other two interdisciplinary joined Postgraduate programs:

4. The Postgraduate Program "**Sustainable Management of Environmental Changes and Circular Economy" (http://www.prd.uth.gr/m_smecce/).**

This program of postgraduate studies is co-organized by the Departments of Planning and Regional Development (DPRD), Civil Engineering (DCE), and Agriculture Crop Production and Rural Environment (DACPRE) of the University of Thessaly, while it is operated from the academic year 2018-2019.

This postgraduate program aims A) at an in-depth diagnosis and understanding of environmental problems, B) to explain how the environmental problems are related to the human factor, and C) environmental programs management of utilizing the science, technology, and governance. The ultimate goal of this program is environmental conservation, which will not be achieved at the expense of social and economic development, but rather for the benefit of society and at a low cost. Given the need to change the linear model of material flow through the economy to a circular model based on the fourfold "reuse, repair, renovation, and recycling," a switch from the linear model "supply, production, consumption, disposal" to a circular model based on the fourfold "reuse, repair, renovation, and recycling" is required. This change is based on maximizing the efficiency of existing resources. The focus of the pollution control and management plan should be shifted to pollution prevention and waste conversion into resources. The postgraduate program also examines: A) the nature, causes and effects of main forms of environmental change, B) How the environmental change interact globally, regionally and locally? C) How the environmental change affects the ecosystems and societies? and D) the sustainable solutions to this change, through rational management, prevention, mitigation, adaptation, waste minimization, circular economy, and design of new sustainable/green products or services.

5. The Postgraduate Program "**Host-microbe interactions" (**https://hosmic.uth.gr**).**

This program (HosMic) of postgraduate studies is co-organized by the Departments of Ichthyology and Aquatic Environment (DIAE), Agriculture Crop Production and Rural Environment (DACPRE), and Biochemistry and Biotechnology (DBB) of the University of Thessaly, while it is operated from the academic year 2022-2023. HosMic is an MSc program exclusively specialized in symbiotic relations between micro and macro-organisms, but also between microorganisms. The role of animal and plant microbiomes is associated with interdisciplinary fundamental and applied scientific fields. The main scope of HosMic is the graduate specialization in fundamental and applied research processes of topics dealing with host-microbe interactions. This program is implemented exclusively in English and for this it is open to international students, while its participating tutors are well-established international researchers on organism microbiomes.

This program of Postgraduate Studies consists of eight (5) courses and a Master Thesis. The program is accredited according to the European Credit Transfer System (ECTS) and successful completion requires students to achieve a total of 75 ECTS credits (ECTS credits per course=6, ECTS credits of thesis=45). The expected time of completion is two (2) semesters, including the submission and presentation of the Thesis. The program has tuition fees.

C.7.5 Doctoral studies

Holders of Integrated Masters or Master of Science Degrees are given the opportunity to pursue Doctoral Studies. Those interested to become PhD Candidates must submit an official request and all relevant documents to the Secretary of the Department. A three-member committee evaluates the perspective PhD Candidate's profile whether the necessary prerequisites are fulfilled and drafts an official report to the Department General Assembly making their recommendation. The Department General Assembly decides whether the person should become a PhD Candidate. Members of Academic Staff may supervise up to 5 PhD Candidates at any given time. To every PhD Candidate, the General Assembly assigns a three-member supervising committee, which in turn suggests to the General Assembly the topic of the PhD Thesis. The course duration ranges from a minimum of 3 years and to a maximum of 8 years. The PhD Candidate should also attend two taught modules, as required by their supervising committee after a recommendation of the supervisor. The supervisor, in collaboration with the PhD candidate, should submit a yearly report of progress, which would include the future work scheduled for the subsequent year. The PhD Candidate must also present two seminars relevant to their area of speciality. The PhD course should aim at achieving novelty and excellence, which should be shown with at least one publication in a peer-reviewed scientific Journal reporting data from the PhD Candidate's research. For the final evaluation of the PhD Candidate at the completion of the PhD study, a seven-member examination committee is selected by the General Assembly; this committee includes the three members of the supervising committee. The PhD

Candidate presents and defends orally her/his Thesis publically in front of the examination committee, which evaluates the novelty and excellence of the examined research and decides whether the PhD Candidate may be qualified for the Degree of Doctor of Philosophy.

C.7.6 Foreign languages

The attendance of English (or French, German or Italian) language courses in the Department of Agriculture Crop Production and Rural Environment is mandatory.

C.7.7 Exams

A record of the student examination grades is kept by the Department Secretary. The examination method (written, oral or a combination of the two, take-home exam, thesis, etc) is decided by the professor responsible for the course and it is mentioned in the analytical Study Program. Student progress in specific allocated work and their performance in laboratory and practices may constitute additional criteria for the calculation of the final grade. Examinations are in Greek and all the participants are examined in the same way. Teaching is also in Greek.

For the foreign exchange students, a list of subjects is available to choose courses from. The professors teaching the chosen courses have the obligation to help the foreign exchange students to understand and deepen into the course subject in English or French. The students are evaluated, and the academic credit units for the specific course are accordingly allocated.

In every academic year there are 3 examination periods.

- ✔ One after the end of each semester, January and June, only for the courses taught during those semesters.
- ✔ A repeat examination period in September, for courses taught during the entire academic year.

Examination marks for each course are based on a **10-grade scale**, from 0 to 10, with 5 being the minimum pass level and 10 the maximum. The equivalence of the ECTS scores to the local grading marks is given below.

C.8. CURRICULUM SYLLABUS

C.8.1. General Information

The Department of Agriculture, Crop Production and Rural Environment offers through the Curriculum the most updated knowledge required to guide the production and management of agricultural products in today's internationally competitive agriculture. In particular, it covers the required knowledge to properly evaluate and manage the genetic material, apply the modern scientifically correct cultural practices (plant physiology, plant nutrition, farm mechanization, plant protection), manage the crop products, always respecting humans and the environment.

The Curriculum of the Department of Agriculture, Crop Production and Rural Environment involves five years of studies and the requirements to graduate include at least 300 ECTS units. Course work for graduation includes 55 courses (250 ECTS units), including 48 mandatory courses and 7 elective courses [the student in collaboration with the major professor (the teaching staff where his/her thesis is developed) choose from a list of 21 offered courses]. In addition, for graduation a two-month-long practice (20 ECTS units) and the completion of a research thesis (30 ECTS units) are required.

The satisfactory completion of Curriculum requirements concludes to degree inauguration on Agriculture, Crop Production and Rural Environment, which consists of **Bachelor's degree with integrated master of science (M.Sc.)** (Greek law 496/B'/20-2-2019) and corresponds to level 7 on the National Qualification Framework and European Qualification Framework -EQF. According to the External Evaluation Report of the Hellenic Authority for Higher Education (HAHE), the Undergraduate Study Program (Integrated Master) of the Department of Agriculture Crop Production and Rural Environment complies with the quality standards of HAHE and the standards for Quality Assurance in the European Higher Education Area (ESG 2015) for level 7 of the National and International Qualifications Framework. **The accreditation is valid for four years, from 29-05-2020 to 28-05-2024.**

C.8.2. Curriculum setup and targeted acquired knowledge

The undergraduate curriculum of the Department of Agriculture, Crop Production and Rural Environment consists of:

✔ **Courses directly related to basic sciences** to secure the foundations of the basic scientific knowledge required to follow the rest of curriculum on the science of Agriculture (Applied Mathematics & Statistics for Agricultural Sciences, General and Inorganic Chemistry, Physics and Agrometereology, General and Cell Biology,

Ecology and Biodiversity, Organic Chemistry and Environmental Pollutants, Biochemistry, Molecular Biology - Biotechnology). These courses are taught during the 1st but also in the next semesters.

✔ **Foundation courses on the wide subject of the science of Agriculture** (Plant Morphology and Anatomy, Biometry and Agricultural Experimentation, Soil Science, Principles of Agricultural Economics and Management of Agricultural Holdings, Genetics, Hydraulics, Agricultural Zoology, Agronomy, Systematic Botany, Plant Physiology, Hydrology, Management of Terrestrial Ecosystems, Hydroponic Systems, Pomology, General Plant Pathology, Vegetable Production I and II, Plant Breeding, Irrigation I, General Entomology, Weed Science, Farm Mechanization, Agricultural Pharmacology, Seed Physiology-Ecology and Technology, Soil Fertility-Fertilizers-Plant Nutrition, Floriculture I, Food Technology and Processing of Agricultural Products), which are taught from the 2nd up to 7th semester.

✔ **Specialization courses on the wide subject of the science of Agriculture** (Field Crops I, Field Crops II, Specific Pomology, Specific Aspects of Plant Pathology, Agricultural Constructions-Greenhouses, Special Plant Breeding and Seed Production of Agricultural and Horticultural Crops, Applied Entomology, General Viticulture) which are mainly offered during the 8th semester.

✔ **Courses for further specialization and insights to specific subjects** with elective courses during the two last semesters (9th and 10th semesters), when students are able to elect the most appropriate for their interests from a wide number of elective courses (21 offered courses), 'building' in this way their professional profile on the specializations of the Agricultural science. Thus, besides the specialization courses offered during the 8th semester, the further specialization and scientific profile development is completed with the elective courses during the two last semesters of studies (9th and 10th semester), when the student in collaboration with his/her major professor (where he/she completes the Thesis) chooses the courses to develop its specialization in the science of Agriculture, Crop Production and Rural Environment, and in accordance with the departmental scientific sectors.

✔ **Practice 2-month duration,** during the summer months after the completion of the 6th semester of studies.

✔ **Research thesis**, which accounts for 30 ECTS units, i.e. as course burden of an academic semester. The research thesis is mandatory, personal research work, as a way to secure the deep knowledge development in the science of Agriculture and the particular specializations. The thesis has a specific personalized subject and is a complete study on a certain scientific area of Agriculture.

The targeted acquired knowledge to be developed from the curriculum of the Department of Agriculture, Crop Production and Rural Environment focuses on offering the necessary scientific knowledge and expertise to the graduates, so they are capable of

- applying, managing and developing the knowledge and expertise for the qualitative and quantitative advancement of plant production with emphasis on the development and application of proper practices based on the integrated and sustainable production and environmental protection,
- managing and using the classic and modern methodology to develop new genetic resources and propagate plant material,
- decision making, using scientific knowledge and the new technologies available to agriculture, guiding and organizing the farmers and their businesses to the application of good agricultural practices, to the reduction of energy and chemical inputs, to the sustainable management of natural resources, and to the safe production and quality certification of agricultural plant products, raw and processed.
- developing and applying the agricultural policies,
- training and communicating the agricultural science to stakeholders.

This perception of the curriculum structure offers to Agriculture graduates of the Department of Agriculture, Crop Production and Rural Environment, the particular qualifications necessary to thoroughly support the graduates' role as an agriculturist consultant and investigator, in the contemporary, competitive and environmentally-friendly plant production and product management.

C.8.3. Course schedule

The syllabus was approved by the General Assembly of the Department on 29 May 2014, and is valid from the fall semester of 2020. The following table presents the courses and their respective ECTS units:

	1st SEMESTER	**LECTURES** (hours/week)	**TUTORIAL CLASSES** (hours/week)	**LABORATORY CLASSES** (hours/week)	**ECTS**	**COURSE COORDINATOR**
1.	Applied Mathematics & Statistics for Agricultural Sciences	2	1	1	6	C. Nakas
2.	General and Inorganic Chemistry	2		2	6	N. Tsiropoulos
3.	Physics and Agrometereology	3		2	6	N. Katsoulas
4.	General and Cell Biology	2		2	5	P. Madesis
5.	Ecology and Biodiversity	2		2	5	A. Sfougaris
6.	Foreign Language	2	1		2	
	Total				**30**	

ECTS UNITS 30

	2nd SEMESTER	LECTURES (hours/week)	TUTORIAL CLASSES (hours/week)	LABORATORY CLASSES (hours/week)	ECTS	COURSE COORDINATOR
1.	Plant Morphology and Anatomy	2		2	5	Aris Kyparissis-Sapountzakis
2.	Biometry and Agricultural Experimentation	2		2	6	C. Nakas
3.	Organic Chemistry and Environmental Pollutants	3		2	6	N. Tsiropoulos
4.	Soil Science	2		2	6	V. Antoniadis
5.	Principles of Agricultural Economics and Management of Agricultural Holdings	2		2	5	G. Vlontzos
6.	Foreign Language	2	1		2	
	TOTAL				**30**	

ECTS UNITS 30

	3rd SEMESTER	LECTURES (hours/week)	TUTORIAL CLASSES (hours/week)	LABORATORY CLASSES (hours/week)	ECTS	COURSE COORDINATOR
1.	Genetics	2		2	5	O. Pavli
2.	Agricultural Development	2	2		5	G. Vlontzos
3.	Plant Physiology	2		2	5	E. Levizou
4.	Hydraulics	2		2	4	V. Antoniadis
5.	Agricultural Zoology	2		2	5	N. Papadopoulos
6.	Biochemistry	2		2	4	P. Madesis
7.	Foreign Language	2	1		2	
	TOTAL				30	

ECTS UNITS 30

	4th SEMESTER	LECTURES (hours/week)	TUTORIAL CLASSES (hours/week)	LABORATORY CLASSES (hours/week)	ECTS	COURSE COORDINATOR
1.	Management of Terrestrial Ecosystems	2		2	5	A. Sfougaris
2.	General Microbiology	3		1	5	E. Vellios
3.	Systematic Botany	3		2	5	A. Karkanis
4.	Hydroponic Systems	2		2	5	N. Katsoulas
5.	Agronomy	2		2	5	N. Danalatos
6.	Irrigation I	2	2	3	5	Antoniadis
	TOTAL				**30**	

ECTS UNITS 30

	5th SEMESTER	LECTURES (hours/week)	TUTORIAL CLASSES (hours/week)	LABORATORY CLASSES (hours/week)	ECTS	COURSE COORDINATOR
1.	General Plant Pathology	3		2	5	E. Vellios
2.	Pomology I	2		2	5	G. Nanos
3.	Weed Science	2		2	5	A. Karkanis
4.	Soil Fertility-Fertilizers-Plant Nutrition	2		2	5	V. Antoniadis
5.	Agricultural Constructions-Greenhouses	2		2	5	N. Katsoulas
6.	Vegetable Production I	2		2	5	S. Petropoulos
	TOTAL				**30**	

ECTS UNITS 30

	6th SEMESTER	LECTURES (hours/week)	TUTORIAL CLASSES (hours/week)	LABORATORY CLASSES (hours/week)	ECTS	COURSE COORDINATOR
1.	Molecular Biology - Biotechnology	2		2	5	P. Madesis
2.	Plant Breeding	2		2	5	O. Pavli
3.	General Entomology	2		2	5	N. Papadopoulos

4.	Food Technology and Processing of Agricultural Products	2		2	5	O. Gortzi
5.	Vegetable Production II	2		2	5	S. Petropoulos
6.	Practice				5	
	TOTAL				**30**	

ECTS UNITS 30

	7th SEMESTER	**LECTURES** (hours/week)	**TUTORIAL CLASSES** (hours/week)	**LABORATORY CLASSES** (hours/week)	**ECTS**	**COURSE COORDINATOR**
1.	Field Crops I	2		2	5	N. Danalatos
2.	Farm Mechanization	2		2	5	N. Katsoulas
3.	Agricultural Pharmacology	2		2	5	N. Ntalli
4.	Floriculture I	2		2	5	C. Lykas
5.	Seed Physiology, Ecology and Technology	2		2	5	O. Pavli
6.	Practice				**5**	
	TOTAL				**30**	

ECTS UNITS 30

	8th SEMESTER	**LECTURES** (hours/week)	**TUTORIAL CLASSES** (hours/week)	**LABORATORY CLASSES** (hours/week)	**ECTS**	**COURSE COORDINATOR**
1.	General Viticulture	2		2	5	D. Petoumenou
2.	Specific Pomology	2		2	5	G. Nanos
3.	Applied Entomology	2		2	5	C. Athanassiou
4.	Specific Topics in Plant Pathology	2		2	5	I. Vagelas
5.	Special Plant Breeding and Seed Production of Agricultural and Horticultural Crops	2		2	5	O. Pavli
6.	Field Crops II	2		2	5	N. Danalatos

	TOTAL				**30**	

ECTS UNITS 30

	9th SEMESTER	**LECTURES** (hours/week)	**TUTORIAL CLASSES** (hours/week)	**LABORATORY CLASSES** (hours/week)	**ECTS**	**COURSE COORDINATOR**
1.	Diseases of Ornamental Plants and Field Crops	2		2	4	I. Vagelas
2.	Stored Product Protection	2		2	4	C. Athanassiou
3.	Organic and Innovative Crop Production Methods	2		2	4	P. Maletsika
4.	Introduction to Entrepreneurship	2	2		4	Y. Stamboulis
5.	Floriculture II	2		2	4	C. Lykas
6.	Equipment and Technologies for Postharvest Treatment of Agricultural Products	2		2	4	N. Katsoulas
7.	Geographical Information Systems and Remote Sensing	2		2	4	A. Kyparissis-Sapountzakis
8.	Pests of Public Health	2		2	4	C. Athanassiou
9.	Specific Viticulture	2		2	4	D. Petoumenou
10	Oenology	2		2	4	D. Petoumenou
11.	Standardisation – Quality Control of Agricultural Products	2		2	4	O. Gortzi
12.	Introduction to Crop Growth Modeling	2		2	4	N. Danalatos
	Thesis				14	
	TOTAL				**30**	

ECTS UNITS 30

9th Semester: Each student must complete 4 elective courses

	10th SEMESTER	**LECTURES** (hours/week)	**TUTORIAL CLASSES** (hours/week)	**LABORATORY CLASSES** (hours/week)	**ECTS**	**COURSE COORDINATOR**
1.	Farm Machinery Management	2		2	4	N. Katsoulas
2.	Soil Contamination, Improvement and Management of Problem Soils	2		2	4	V. Antoniadis

3.	Landscape Architecture and Urban Green Infrastructures	2		2	4	C. Lykas
4.	Plant Stress Physiology	2		2	4	E. Levizou
5.	Food Safety and Quality Assurance	2		2	4	O. Gortzi
6.	Aromatic, Medicinal and Energy Production Plants	2		2	4	K. Giannoulis
7.	Bioinformatics	2		2	4	C. Nakas
8.	Asexual Plant Propagation	2		2	4	G. Nanos
9.	Apiculture-Sericulture	2		2	4	N. Papadopoulos
10.	Development of Business Plans	2	2		4	Y. Stamboulis
11.	Oliviculture	2		2	4	P. Maletsika
12.	Diseases of Vegetable Crops	2		2	4	E. Vellios
	Thesis				16	
	Practice				2	
	TOTAL				**30**	

ECTS UNITS 30

10th Semester: Each student must complete 3 elective courses

To get a degree from the Department of Agriculture, Crop Production and Rural Environment, the students must complete 55 courses (48 mandatory courses including Foreign Language courses and 7 elective courses). In terms of credit units, the requirement is a total of 300 ECTS units.

D. COURSE OUTLINES

1st Semester (Fall)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Christos Nakas, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION & RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1029	**SEMESTER**	1st (FALL)
COURSE TITLE	APPLIED MATHEMATICS & STATISTICS FOR AGRICULTURAL SCIENCES		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	6 ECTS
COURSE TYPE	General background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_153/		

2. LEARNING OUTCOMES

Learning outcomes
Level 6: Knowledge and understanding of applications of mathematics and statistics in practical problems related to agricultural applications. Applications of optimization, modeling, analytical procedures, and descriptive statistics using linear regression, linear approximations, matrix algebra, combinatorics, calculus and differential equations. Use of computer s/w and IT skills development.
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Decision-making Working independently Working in an international environment Working in an interdisciplinary environment Production of new research ideas Project planning and management Production of free, creative and inductive thinking

3. SYLLABUS

Matrix algebra, determinants Functions, the linear model Descriptive statistics Combinatorics Probability

Confidence intervals Differentiation and applications Integral calculus Probability distributions Multivariate calculus Differnetial equations Use of related s/w (choices between MS Excel, Minitab, Wolframalpha, Geogebra, XCas)

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of ICT in teaching, e-class (notes, exercises, communication w students), applications at computer room/lab.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Lab/practice	26
Essay writing	20
Study and analysis of bibliography	78
Course total	**150**

STUDENT PERFORMANCE EVALUATION	Written exams (problem solving) 70%, public presentation (5-20%), written work 10-25%. Evaluation criteria/results accessible to students at the lab.

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Bodine et al (2014) Mathematics for the Life Sciences, Princeton University Press
2. Biau et al (2010) Mathématiques et statistique pour les sciences de la nature, EDP Sciences

- Related academic journals:

Biometrics
Journal of Agricultural, Biological and Environmental Statistics

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Nikolaos Tsiropoulos, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	AK0103	**SEMESTER**	1st (FALL)
COURSE TITLE	GENERAL AND INORGANIC CHEMISTRY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		4	6 ECTS
COURSE TYPE	Background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	NO		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_128/		

2. LEARNING OUTCOMES

Learning outcomes
✔ Knowledge of the basic principles of chemistry as essential background for biological and agricultural studies. Preliminary knowledge in basic concepts of atomic structure and in the use of the periodic table of elements. ✔ Understanding of the stereochemistry, the polarity and the intermolecular interactions of molecules and their applications. ✔ Understanding and application of chemical equilibrium, the chemistry of acids and bases and their solutions. Basic introductory knowledge in redox actions and coordination compounds. ✔ Familiarize students with the reagents, instruments and utensils of the laboratory and their correct and safe use. Understanding and application of basic techniques in laboratory practice and analysis, processing and evaluation of experimental results
General Competences
Adapting to new situations Decision-making Work independently Team work Respect of the natural environment Production of free, creative and inductive thinking

3. SYLLABUS

i. Atomic structure. Atomic orbitals. Periodic system of elements and periodic properties.
ii. Chemical bond. Introduction to covalent bond. Stereochemistry - VSEPR theory. Polarity of the molecules, Intermolecular forces and their applications.
iii. Chemical equilibrium. Acid and Base solutions and chemical equilibrium. Degree of ionization, pK, pH, Hydrolysis, Buffer solutions, Titration curves, Electrolytic indicators.
iv. Coordination compounds

v. Elements of thermodynamics.
vi. Elements of oxidation and reduction
vii. Elements of Analytical Chemistry (solutions, qualitative and quantitative analysis, titration, spectrometry).
viii. Examination of certain elements and compounds agronomic and environmental interest
Laboratory practice and tutorial (laboratory, safety, reagents, instruments, and their use, Solutions preparation, chemical equilibrium, pH measurement, buffer solutions, Acid Base titration, Titration curves, Qualitative analysis, Spectrometry UV –Vis, production and use of calibration curve)

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of ICT in teaching, e-class. Power point presentations. Communications with students via e-mail.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice	18
Tutorials, placements	8
Essay writing (laboratory practice)	30
Autonomous study	68
Course total	**150**

STUDENT PERFORMANCE EVALUATION	1. Final written exams (60%). The final examination comprises short -answer questions, long-answer questions and problems questions. 2. Laboratory work evaluation (40%). Evaluation of essay writing (laboratory practice) and exams on laboratory practice content. Minimum passing grade=5 (A scale of 1 to 10 applies to the marks of each subject in the Hellenic Higher Education)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Lalia-kantouri M. & Papastefanou S., General and Inorganic Chemistry, Ed. Ziti, 2010.
2. http://eclass.uth.gr/eclass/courses/SGEA170/
3. Manousakis G., Aslanidis P. And Bolos Ch., Principes of general Chemistry, Ed. Kyriakidis, 1998.
4. Manoussakis G., General Chemistry for medicine, Ed. Kyriakidi, 2000.
5. Caret, Denniston and Topping, Principes and Applications of General, Organic and Biological Chemistry, Ed. Paschalidis, Athens, 2000.
6. Tsiropoulos N., Laboratory practices and Note of general chemistry, Editions of University of Thessaly, Volos 2010. (in Greek language)

- Related academic journals:

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nikolaos Katsoulas, Professor; Dr. Anastasia Angelaki (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1030	**SEMESTER**	1st (FALL)
COURSE TITLE	PHYSICS AND AGROMETEOROLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		5	6 ECTS
COURSE TYPE	Special background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_178/		

2. LEARNING OUTCOMES

Learning outcomes

The course aims to introduce students in issues related to some branches of Physics and Meteorology.

The contents of the 1st part of the course, which is related to Physics, aim to introduce the students in concepts, laws and applications of fluid mechanics, thermodynamics, optics and nuclear physics. The students will have the chance to get background knowledge in these branches, which will be useful to them when getting involved in several agricultural applications in the future, either as students or as professionals. The laboratory exercises that are taking place in the frame of the 1st part of the course aim to make students familiar with the use of equipment and to verify natural laws that are introduced in the theoretical part of the course. For this purpose, experiments are conducted to record data and afterwards measurements are analyzed by the students.

The contents of the 2nd part of the course, which is related to Meteorology and Agrometeorology, aim to assist the students to understand the mechanisms that drive several meteorological phenomena and to assess the impact of weather to agriculture. Additionally, the impact and the variations of several meteorological parameters are studied and monitoring equipment and techniques are presented. Moreover, climate issues and its impacts to agriculture are discussed.

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

- Understand concepts and laws of fluid mechanics, thermodynamics, optics and nuclear physics.
- Describe meteorological parameters and phenomena.
- Apply laws of the above mentioned branches of Physics in agricultural applications.
- Assess the impact of meteorological phenomena and climate change to the agricultural sector.
- Use equipment to monitor natural and meteorological parameters.

- Accept the multi discipline character of agricultural science.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management
Adapting to new situations	Respect for difference and multiculturalism
Decision-making	Respect for the natural environment
Working independently	Showing social, professional and ethical responsibility and sensitivity to gender issues
Team work	Criticism and self-criticism
Working in an international environment	Production of free, creative and inductive thinking
Working in an interdisciplinary environment	……
Production of new research ideas	Others…
	…….

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Working independently
- Team work
- Working in an interdisciplinary environment
- Production of new research ideas
- Respect for the natural environment

3. SYLLABUS

a. Physics

Fluid mechanics:

Elasticity. Fluid statics. Basic concepts and laws of fluid mechanics. Molecular interactions in fluids. Surface phenomena. Capillarity. Adsorption. Fluids dynamics. Viscosity. Continuity and Bernoulli's laws. Buoyancy. Poisseuille's law.

Heat and thermodynamics:

Internal energy, heat and temperature. Laws of thermodynamics. Adiabatic process. Carnot's engine. Statistical interpretation of entropy. Heat transfer. Plank's, Stefan's and Wien's laws. Diffusion. Osmotic pressure. Van 't Hoff's law. Thermal expansion and contraction. Van der Waals equation. Phase changes.

Optics:

The wave nature of light. Photometry. Reflection and refraction. Geometric optics. Mirrors and lenses. The microscope. Dispersion of X-rays by crystals. Electron microscope. Polarization, Malus law. Optical activity. Spectroscopy. Emission and absorption spectra. Line spectra. Infrared and ultraviolet radiation.

Nuclear physics:

Structure of the nucleus. Fundamental particles. Binding energy. Radioactivity. a, b and γ radioactive decay. Nuclear reactors. Fusion. Dosimetry. Biological effects of nuclear radiation.

b. Agrometeorology

Atmospheric layers. Atmospheric composition. Atmospheric pollution. Earth's radiation and energy budget. Atmospheric characteristics and dynamics. Atmospheric motion. Formation of low- and high-pressure systems. Agrometeorological and climate monitoring stations. Meteorological equipment and observations of temperature, humidity, evaporation, sunshine, cloudiness, solar radiation, precipitation, atmospheric pressure, wind speed and direction. Data analysis. Introduction to climate issues. Climate classification. Climate zones. The climate of Greece. Climate change. Local climate, microclimate. Urban microclimate. Farm and arboretum climate.

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>MODES OF DELIVERY</td><td>Class attendance</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>● Use of ICT in teaching
● Support of the learning process through the electronic platform e-class
● Communication with students also via email
● Use of laboratory equipment</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>Laboratory practice</td><td>26</td></tr><tr><td>Study and analysis of bibliography</td><td>25</td></tr><tr><td>Essays writing</td><td>20</td></tr><tr><td>Non-directed study</td><td>40</td></tr><tr><td>Course total</td><td>150</td></tr></table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>I. Final written exam (50%) that includes:
- Short-answer questions
- Problem solving

II. Written essays (50%) that include the analysis of data collected during the laboratory practice.</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Ahrens DC, 2009. Meteorology Today: An Introduction to Weather, Climate, and the Environment. Brooks/Cole, ISBN 978-0-495-55573-5.

Halliday D, Resnick R, Walker J, 2014. Fundamentals of Physics Extended, 10th Edition. Wiley, ISBN: 978-1118230725.

- Related academic journals:

Agricultural And Forest Meteorology, Elsevier
Annals of Physics, Elsevier
Atmospheric Research, Elsevier
Biosystems Engineering, Elsevier
Theoretical And Applied Climatology, Springer
Theoretical and Computational Fluid Dynamics, Springer

COURSE OUTLINE

COURSE COORDINATOR/INSTRUCTOR: Panagiotis Madesis, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	B0102	**SEMESTER**	1st (FALL)
COURSE TITLE	GENERAL AND CELL BIOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		2+2	5 ECTS
COURSE TYPE	General background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_125/		

2. LEARNING OUTCOMES

Learning outcomes
1. Understanding of the basic cell structures and their function. 2. Learning the taxonomy of all life forms. 3. Training in basic laboratory techniques of biology.
General Competences
1. Finding, analyzing and synthesizing data and other information, by utilizing the net browsers and other appropriate digital multimedia. 2. Group and individual work. 3. Encouragement of free, creative and inductive thought.

3. SYLLABUS

1. Cell types, subcellular structures visible under the light of electron microscope (mitochondria, plastids, vacuoles, nucleus, endoplasmic reticulum, ribosomes, lysosomes, transport vesicles).
2. Cellular nanostructures invisible microscopically, whose structure is inferred by biochemical, physicochemical assays.
3. Chemical structures of the main groups of organic molecules encountered in cells and involved in their function (includes proteins, nucleic acids, sugars, lipids).
4. Mechanisms of function of all above cellular structures at the molecular level (cell division, endo- and exo-cytosis, cell movement, cell interactions among themselves and with the environment, molecular movements among subcellular entities, interactions among the various molecules.
5. Morphological, biochemical and physiological description of various organism and their taxonomic categorization, with emphasis to their evolutionary emergence.
6. Probable route of emergence and evolution of tissues and organs.
7. Techniques of staining and microscopic observation of subcellular organelles and other structures (nuclei, mitochondria, plastids, cell membranes and cell walls.

8. Techniques for observation of cellular processes (cell division, plasmolysis).
9. Isolation of organelles and plant molecular constituents (chloroplasts, chlorophylls, carotenoids, cellulose).
10. Techniques for the effect of plant hormones on explants.
11. Genetic information flow and cell circle
12. Cellular communication and connection

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Face-to-face (Lectures in the class and lab exercises) using PowerPoint distance learning (via the E-class course page)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Via the E-class
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>26</td></tr><tr><td>Laboratory practice</td><td>26</td></tr><tr><td>Group work (essay writing)</td><td>43</td></tr><tr><td>Study and analysis of bibliography</td><td>30</td></tr><tr><td>Course total</td><td>125</td></tr></table>
STUDENT PERFORMANCE EVALUATION	1. Final examination on multiple choice questions, in Greek, including also laboratory practise themes and accounting for the 75% of the final grade (15% of the grade will be attributed to lab based questions). 2. Assays and public presentation of bibliographical work, accounting for 25% of the final grade

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Θωμόπουλος Γ. 1995. Ο υποκυτταρικός κόσμος. Εκδόσεις, UNIVERSITY STUDIO PRESS - ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΙΑ ΓΡΑΦΙΚΩΝ ΤΕΧΝΩΝ ΚΑΙ ΕΚΔΟΣΕΩΝ (In Greek)
2. Μαργαρίτης Λουκάς Χ. 2004. Βιολογία Κυττάρου. Εκδόσεις Κ. & Ν. ΛΙΤΣΑΣ Ο.Ε. (In Greek)
3. Cooper G., Hausman R. 2017. Το κύτταρο. ΑΚΑΔΗΜΑΪΚΕΣ ΕΚΔΟΣΕΙΣ Ι. ΜΠΑΣΔΡΑ & ΣΙΑ Ο.Ε. (In Greek)

- Related academic journals:

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Athanassios Sfougaris, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1018	**SEMESTER**	1st (FALL)
COURSE TITLE	ECOLOGY AND BIODIVERSITY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		4	5 ECTS
COURSE TYPE	General background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English) Tutoring and Lectures		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_165/		

2. LEARNING OUTCOMES

Learning outcomes
✔ Knowledge of environmental factors affecting organisms, ✔ Knowledge of macro- and micro-nutrients essential to plants and their recycling, ✔ Understanding the mechanisms defining the structure and function of populations, communities and ecosystems, ✔ Understanding the energy flow in ecosystems, ecosystem productivity and ecological succession, ✔ Knowledge of biodiversity structure, factors affecting biodiversity and methods estimating biodiversity indicators
General Competences
Decision-making Work independently Team work Respect of the natural environment Production of free, creative and inductive thinking

3. SYLLABUS

- Introduction to environmental factors and adaptations of organisms,
- Ecology of individuals, population size and density,
- Survival, fertility, mortality, population growth, stochastic models in populations,
- Intraspecific and interspecific competition, niche, predation, population cycles and fluctuations, r- and K strategy,
- Communities and ecosystems, diversity and stability, primary and secondary productivity,
- Food chains, ecological pyramids and networks, energy flow,

- Biogeochemical cycles, ecological succession theories,
- Definition of biodiversity, Rio Convention, structural elements, quantification, assessment indexes and methods and evaluation of biodiversity,
- Evolution of biodiversity, species extinctions, population reductions, present status of species,
- Methods of mapping of biodiversity, number of species – area relationship, biogeographic regions, endemism, biodiversity variations,
- Effects of environmental and human parameters on biodiversity, management measures, conservation perspectives, the Greek strategy for the conservation of biodiversity,
- Organic Agriculture and Biodiversity,
- Agroecosystems - factors affecting agricultural biodiversity and causes for biodiversity losses.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Face to face in the classroom
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	● Use of ICT in teaching, e-class, ● Power point presentations, ● Communications with students via e-mail.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice	26
Educational visits-projects	6
Autonomous study	67
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Final written exams (80%). The final examination comprises short -answer questions and long-answer questions. Laboratory work evaluation (20%): Exams on laboratory practice content. Minimum passing grade=5 (A scale of 1 to 10 applies to the marks of each subject in the Hellenic Higher Education)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Begon M., Howarth R., Townsend C. (Greek edition: Sgardelis S., Dimopoulos P., Pyrintzos S.) 2015. Ecology: Populations, communities and applications.
2. Vokou D. 2009. General Ecology. 1st Edition, ISBN: 978-960-12-1769-7, Publisher: University Studio Press S.A. (in Greek).
3. Veresoglou D. 2010 (3rd edition). Ecology. ISBN: 978-960-7013-36-1, Publisher: Gartaganis Dionysios (in Greek).
4. Primack R., Arianoutsou M., Dimitrakopoulos P. 2017. Conservation biology, an itroduction. University Studio Press.

- Related academic journals:

Ecology, Oecologia, Oikos, Journal of Ecology, Advances in Ecological Research, Ecological Monographs, Ecological Applications, Ecography.

2nd Semester (Spring)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Aris Kyparissis-Sapountzakis, Associate Professor ; Elpiniki Sjoufogianni (Laboratory Teaching Staff)

1. *GENERAL*

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΕΦ0503	**SEMESTER**	2nd (SPRING)
COURSE TITLE	PLANT MORPHOLOGY AND ANATOMY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5
COURSE TYPE	Specialised general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_164/		

2. LEARNING OUTCOMES

Learning outcomes
By the end of this course, the students will: 1) Know the structure of all plant parts, from the sub-cellular to plant organ level, and understand the morphological, functional and physical properties of plant body 2) Understand and be able to describe how the specific structure supports the specific function, thus the structure-function relationships which enabled adaptations to changing environments in geological time 3) Be familiar with the light microscope for observing and identifying plant cells/tissues and acquisition of skills in hand-preparing microscopic slides of plant material and interpretation of the observed image
General Competences
Basic and specialized knowledge of the natural world Working independently Team work Working in an interdisciplinary environment Production of new research ideas Respect for the natural environment

3. SYLLABUS

Plant cell structure with emphasis on cell wall, chloroplasts and vacuoles

Plant tissues, organs and their developmental strategies

Leaf morphology, anatomy and metamorphoses

Stem morphology, anatomy and metamorphoses

Root morphology, anatomy and specific functions

Floral morphogenesis, pollination and fertilization

Seed anatomy, development and dispersal features

The above-mentioned subjects are presented with emphasis on structure-function relationship, highlighting the structural adaptations to specific environments and the morphological diversity of plant organisms

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	➢ PowerPoint use in lectures ➢ Teaching support by e-learning platform ➢ Communication with students with e-mails via e-learning platform
TEACHING METHODS	

Activity	Semester workload
Lectures/interactive teaching	26
Laboratory practice	26
Non-directed study	73
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Written final examination (100%), including: -multiple choice questionnaires - short-answer questions - questions concerning laboratory practice

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Biology of Plants (8th edition) by P. Raven, R.F. Evert , S.E. Eichhorn; Publisher: W. H. Freeman, 2012
2. Functional Plant Anatomy by G. Aivalakis, G. Karabourniotis, G. Liakopoulos and C. Fasseas; Publisher: Embryo, 2014
3. Botany, Mauseth James D., , Broken Hill Publishers LTD 2020

- Related academic journals:

Flora
Trees-Structure and function
Environmental and experimental Botany

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Christos Nakas, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION & RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1029	**SEMESTER**	2nd (SPRING)
COURSE TITLE	BIOMETRY AND AGRICULTURAL EXPERIMENTATION		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	6 ECTS
COURSE TYPE	General background, Skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_115/		

2. LEARNING OUTCOMES

Learning outcomes
Level 6: Knowledge and understanding of experimentation principles and statistics tools for decision making in practical problems related to agricultural applications. Applications of optimization, modeling, analytical procedures, and descriptive statistics using general linear models, procedures for quantitative variables. Use of computer s/w and IT skills development.
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Decision-making Working independently Working in an international environment Working in an interdisciplinary environment Production of new research ideas Project planning and management Production of free, creative and inductive thinking

3. SYLLABUS

The t-test, goodness-of-fit, chi-square tests, sampling, experimentation principles, ANOVA procedures according to the experimental design used (crd, rcbd, latin-squares, bibd, interactions in factorial designs, split-plot, split-block, nested designs), post-hoc tests, least significant difference, correlation, ANCOVA. Use of statistics s/w (MS Excel, SPSS, Minitab, Mobile Apps, Online statistics calculators).

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>MODES OF DELIVERY</td><td>Class attendance</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Use of ICT in teaching, e-class (notes, exercises, communication w students), applications at computer room/lab.</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>Lab/practice</td><td>26</td></tr>
<tr><td>Essay writing</td><td>33</td></tr>
<tr><td>Study and analysis of bibliography</td><td>65</td></tr>
<tr><td>Course total</td><td>150</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>Written exams (problem solving) 70%, public presentation (5-20%), written work 10-25%. Evaluation criteria/results accessible to students at the lab.</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Statistical procedures for agricultural research, Gomez & Gomez, Wiley 1984.
2. Experimental statistics for agriculture and horticulture, Ireland, Cabi 2010.
3. Design and analysis of experiments, Mongomery, Wiley 2009.

- Related academic journals:

Biometrics
Journal of Agricultural, Biological and Environmental Statistics

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nikolaos Tsiropoulos, Professor; Nikoletta Ntalli, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	BK1032	**SEMESTER**	2nd (SPRING)
COURSE TITLE	ORGANIC CHEMISTRY AND ENVIRONMENTAL POLLUTANTS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		5	6 ECTS
COURSE TYPE	Background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_167/		

2. LEARNING OUTCOMES

Learning outcomes
✔ Knowledge on classification and recognition of organic compounds. ✔ Understanding the structure, physicochemical properties and reactivity of organic compounds through the study of the major classes of organic compounds, such as alkyl halides, alcohols, carbonyl compounds, sugar acids, esters, lipids etc. and molecules with particular interest in agronomic science and environmental pollution. ✔ Presentation and understanding of basic laboratory techniques and skills, and their proper implementation and evaluation of experimental results.
General Competences
Adapting to new situations Decision-making Work independently Team work Respect of the natural environment Production of free, creative and inductive thinking

3. SYLLABUS

ix. Structure, classification and nomenclature of organic compounds. Carbon bonds and structure. The nature of the organic compounds. Elements isomerism and stereochemistry of organic molecules. x. Electronic effects (inductive effect, resonance) and Aromaticity. xi. Reactions and reagents (nucleophilic and electrophilic). Introduction to mechanisms of certain organic reactions –substitution, addition and elimination reactions-. xii. Major classes of organic compounds with special emphasis on the agronomic and environmental interest compounds and their physicochemical properties and their chemical reactivity. (Alkanes,

alkenes, alkyl halides, alcohols, carbonyl compounds, sugars, carboxylic acids and their derivatives, lipids, aromatic compounds phenol, amines).

xiii. The organic substances in the environment, toxic organic substances and degradation kinetics.

xiv. Basic laboratory techniques. Introduction to solvents. The concept of extraction and application of the technique of liquid-liquid extraction. Distillation and applications. Introduction to chromatography and basic chromatographic techniques. Application to the column chromatography and thin layer chromatography. Introduction on the kinetics of degradation of organic compounds in the environment.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of ICT in teaching, e-class. Power point presentations. Communications with students via e-mail.
TEACHING METHODS	

Activity	Semester workload
Lectures	39
Laboratory practice	26
Tutorials, placements	
Essay writing (laboratory practice)	21
Autonomous study	64
Course total	**150**

STUDENT PERFORMANCE EVALUATION	1. Final written exams (60%). The final examination comprises short -answer questions, long-answer questions and problems questions. 2. Laboratory work evaluation (40%). Evaluation of essay writing (laboratory practice) and exams on laboratory practice content. Minimum passing grade=5 (A scale of 1 to 10 applies to the marks of each subject in the Hellenic Higher Education)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Βάρβογλης Αναστάσιος, Επίτομη Οργανική Χημεία, Εκδόσεις Ζήτη, 2005. (in Greek).
2. Αλεξάνδρου Ν., Βάρβογλη Α., Οργανική Χημεία, Εκδόσεις Ζήτη, 1996. (in Greek).
3. McMurry J., Organic Chemistry.
4. Caret, Denniston and Topping, Αρχές & Εφαρμογές της Ανοργάνου, Οργανικής και Βιολογικής Χημείας, Τόμοι Ι και ΙΙ, Εκδόσεις Π. Πασχαλίδης, Αθήνα, 2000. (in Greek).
5. Τσιρόπουλος Ν., Εργαστηριακές Σημειώσεις και Ασκήσεις Οργανικής Χημείας, Πανεπιστημιακές Εκδόσεις Θεσσαλίας, Βόλος 2007. (in Greek).

- Related academic journals:

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Vasileios Antoniadis, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΓΚ0303	**SEMESTER**	2nd (SPRING)
COURSE TITLE	SOIL SCIENCE		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		2 (2+2)	6 ECTS
COURSE TYPE	General background		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_145/		

2. LEARNING OUTCOMES

Learning outcomes
This module introduces the students to the basic principles of soil science, and it consists of a theoretical and a practical section. The teaching section aims at introducing students to the basic principles of soil science, the pedogenetic processes, the evolution of inorganic and organic solid phases, the physical and chemical soil properties, and properties of soil water and air, and the basic principles of soil taxonomy. The practicals section aims at providing the skills to the students to carry out and understand the basic soil science laboratory analyses, such as the measurement of pH, electrical conductivity, particle size distribution, calcium carbonate and organic matter. When students successfully complete this module, they should: ● Be familiar with the basic soil science principles, the properties of primary and clay minerals, and the soil properties and functions. ● Be able to obtain a representative soil sample ● Have the skills to carry out soil-related laboratory analyses
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 Team work Working in an international environment Working in an interdisciplinary environment Production of new research ideas

3. SYLLABUS

Teaching

- The description of soil
- Parent materials
- Weathering (physical, chemical, biological).
- Primary and clay minerals
- Soil physical properties.
- Soil organic matter.
- Soil chemical properties.
- Management principles of problem soils.
- Soil taxonomy principles

Practicals

- Soil sampling
- Soil pH
- Soil organic matter
- Particle size distribution analysis
- Electrical conductivity
- Calcium carbonate

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	● Teaching in the class with Power Point. ● Support of teaching activity via the e-class platform
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Practicals	26
Assignment on a topic related to soil science	25
Field trip	25
Self study	48
Total per module (25 hours of workload per ECTS unit)	**150**

STUDENT PERFORMANCE EVALUATION	I. Written examinations (860%) II. Practicals (40%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1. «ΕΔΑΦΟΛΟΓΙΑ» του ΙΚ Μήτσιου-Εκδόσεις Zymel. (in Greek).
2. «ΕΔΑΦΟΛΟΓΙΑ» του Β. Κεραμίδα –Διδακτικές Σημειώσεις ΑΠΘ. (in Greek).
3. «Εργαστηριακές Ασκήσεις» των Α. Δημήρκου –Ε.Ε.Γκόλια Διδακτικές Σημειώσεις ΠΘ. (in Greek).

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: George Vlontzos, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTEMENT OF AGRICULTURE CROP PRODUCTION AND RURAL DEVELOPMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1033	**SEMESTER**	2nd (SPRING)
COURSE TITLE	PRINCIPLES OF AGRICULTURAL ECONOMICS AND MANAGEMENT OF AGRICULTURAL HOLDINGS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Specialised general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_109/		

2. LEARNING OUTCOMES

Learning outcomes
The definition of agricultural activity, development and characteristics definition of agricultural economy 1) Content and relationship with other branches of science. 2) The Importance of Agriculture in the Greek Economy. 3) Economic concepts and principles in agriculture, agricultural production materials. 4) Agricultural holdings and classification field systems and rotation in agricultural holdings 5) Determination of result of yearly activities in agricultural holdings. 6) Planning of agricultural holdings with cost of plant and animal products 7) The concept of investment and varieties of agricultural investment with risk and uncertainty in agriculture.
General Competences
Adapting to new situations Decision -making Production of free, creative and inductive thinking

3. SYLLABUS

Fundamentals of economic production. Inputs. Concept and importance of productivity. Fundamentals disposal of agricultural production. Market operation. Price formation. Economic development and economic systems. Public expenditure. Budget. Agricultural industry. Types of farms, farm size. Intensive and extensive farming. Decision making, organizations planning methods for agricultural holdings. Cost of production of agricultural products. Presentation of investment projects development methodology farm crop and livestock production.

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>MODES OF DELIVERY</td><td>Class attendance</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Teaching in the class with Power Point.
Support of teaching activity via the e-class platform</td></tr>
<tr><td></td><td><table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>52</td></tr>
<tr><td>Autonomous study</td><td>73</td></tr>
<tr><td>Course total</td><td>125</td></tr>
</table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>Evaluation language: Greek
Method of Evaluation: Summative</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1. Farm Management by Ronald Kay, William Edwards, and Patricia Duffy.
2. Making Your Small Farm Profitable: Apply 25 Guiding Principles/Develop New Crops & New Markets/Maximize Net Profits Per Acre by Ron Macher and Howard W. Kerr.
3. Principles of Agribusiness Management by James G. Beierlein, Kenneth C. Schneeberger, and Donald D. Osburn.

3rd Semester (Fall)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Ourania Pavli, Associate Professor; Evangelia Panagiotaki (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΓΚ0301	**SEMESTER**	3rd (FALL)
COURSE TITLE	GENETICS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		4	5 ECTS
COURSE TYPE	General background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_123/		

2. LEARNING OUTCOMES

Learning outcomes
Level 6: Mendelian Analysis, Extensions of Mendelian Genetics, Genotype and Environment, Cell division, Sex inheritance, Linkage and linkage mapping, Gene mutations, Chromosomes and chromosome structures, Changes in chromosome number, Extranuclear inheritance.
General Competences
Working independently Production of new research ideas Project planning and management

3. SYLLABUS

- Mendelian Genetics: Mendel's experiments. Applications of Mendelian Genetics. Mendelian analysis and probability theory.
- Extensions of Mendelian Genetics: Multiple alleles. Lethal alleles. Gene interactions (epistasis). Pleiotropism – Penetrance - Expressivity.
- Genotype and Environment: Genotype and Environment = Phenotype. Norm of reaction. Twin studies.
- Cell Division: Cell cycle and interphase. Mitosis. Meiosis. Spermatogenesis and oogenesis. Sexual reproduction and biological cycles.
- Sex inheritance: Chromosome theory of heredity. Sex inheritance. Sex-linked inheritance. Sex-influenced και sex-limited inheritance.

- Linkage and linkage mapping: Genetic recombination. Linkage of genes. Three-point testcross. Linkage in haploid organisms.
- Gene mutations: About mutations. Types of mutations. Mutation selective systems. Mutagens. Mutations and cancer.
- Chromosomes and chromosome structures: Chromosomes. Changes in chromosome structure.
- Changes in chromosome number: Terminology. Aneuploidy. Euploidy.
- Extranuclear inheritance: Inheritance of chloroplast genes. Mitochondrial inheritance. Maternal effect. Cytoplasmic male sterility in plants.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	● Use of ICT in teaching ● Teaching support by e-learning platform ● Communication with students (e-mails)
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures/interactive teaching</td><td>26</td></tr><tr><td>Laboratory practice</td><td>26</td></tr><tr><td>Study</td><td>73</td></tr><tr><td>Course total</td><td>125</td></tr></table>
STUDENT PERFORMANCE EVALUATION	Written final examination (100%), including: ● multiple choice questions ● short-answer questions ● questions concerning laboratory practice Evaluation in Greek Language (and English upon request).

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Μιχαήλ Γ. Λουκάς, Γενετική, Εκδόσεις Αθ. Σταμούλης (In Greek)
2. Peter J. Russell, iGenetics – Μία Μεντελική Προσέγγιση (Τόμος Ι και ΙΙ), Ακαδημαϊκές Εκδόσεις (In Greek)
3. Anthony J.F. Griffiths, Jeffrey H. Miller, David T. Suzuki, Richard C. Lewontin, William M. Gelbart, An Introduction to Genetic Analysis, Εκδόσεις W.H. Freeman and Company (In Greek)

- Related academic journals:

Nature Genetics, Advances in Genetics, Annual Review of Genetics, Trends in Genetics, Current Opinion in Genetics and Development, PLoS Genetics

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: George Vlontzos, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL DEVELOPMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1034	**SEMESTER**	3rd (FALL)
COURSE TITLE	AGRICULTURAL DEVELOPMENT		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Specialised general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_136/		

2. LEARNING OUTCOMES

Learning outcomes
Understanding the drivers to changes and trends in the general economy • Economic decision-making • Economic and business planning o Time value of money o Basic understanding of accounting and finance tools o Strategic planning • Basic statistics • Market analysis • Enterprise management and production analysis • Decision-making under uncertainty • Understanding of international trade, environmental issues • Introductory foundations in biological and physical sciences as they pertain to agricultural and natural resources
General Competences
Adapting to new situations Decision -making Production of free, creative and inductive thinking

3. SYLLABUS

Concept, content and measurement of agricultural development. The contribution of agriculture to economic growth. Concept, content, objectives and activities of agricultural projects. Design, implementation and evaluation of agricultural programs. Methodology of planning of agricultural policies. Organization and administration of agricultural policies. Content, objectives, institutions, rural

institutions and agricultural systems policies. Ability and obstacles on implementing agricultural policy measures. Income, tax and insurance rural policy.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	● Use of ICT in teaching ● Teaching support by e-learning platform Communication with students (e-mails)
TEACHING METHODS	**Activity** / **Semester workload** Lectures: 52 Autonomous study: 78 **Course total**: **125**
STUDENT PERFORMANCE EVALUATION	Evaluation language: Greek Method of Evaluation: summative

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

System Approaches for Sustainable Agricultural Development Penning de Vries, F.W. (Ed.) ISSN: 0928-9526

Agricultural Policy for the 21st Century Luther G. Tweeten (Editor), Stanley R. Thompson (Editor) ISBN: 978-0-8138-0899-4

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Efthimia Levizou, Associate Professor; Evlalia Koufostathi (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΕΦ0503	**SEMESTER**	3rd (FALL)
COURSE TITLE	PLANT PHYSIOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Specialised general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_180/		

2. LEARNING OUTCOMES

Learning outcomes
By the end of this course, the students will: 1) Know the basic functions of plant organisms 2) Understand and be able to describe the mechanisms through which: a) an immobile organism functions b) biochemistry and physiology supports autotrophy c) internal communication is succeeded d) plant growth responses to environmental factors 3) Address various scientific issues concerning agricultural applications of plant physiology: weed management, floriculture, vegetable production etc.
General Competences
Basic and specialized knowledge of the natural world Working independently Team work Working in an interdisciplinary environment Production of new research ideas Respect for the natural environment

3. SYLLABUS

1. Photosynthesis: ● Light properties, photosynthetic pigments ● Light reactions ● Carbon reactions – C3 cycle

- C2 oxidative photosynthetic carbon cycle
- C4 metabolism
- Crassulacean acid metabolism (CAM)
- Photoinhibition and photooxidation, protective mechanisms and adaptations
- Environmental factors influencing photosynthesis: light, temperature, CO_2
- Photosynthesis and global climate change

2. Water relations:
- water transport
- Water potential
- Water movement in the soil and xylem
- Leaf transpiration
- How plants cope with water stress
- Phloem structure and function
- Translocation in the Phloem

3. Mineral Nutrition:
- Ion uptake mechanisms and short/long-distance transport in plant body
- Regulation of nutrients concentration in different plant organs
- Nutrient foraging
- Plant-microbe interactions for nutrient foraging
- Tolerance and adaptation to toxic soils

4. Plant growth and development:
- Growth snapshots of plant life: seed germination, seedling development, flowering, fruit ripening, leaf shedding and senescence

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	➢ PowerPoint use in lectures ➢ Teaching support by e-learning platform ➢ Communication with students with e-mails via e-learning platform
TEACHING METHODS	

Activity	Semester workload
Lectures/interactive teaching	26
Laboratory practice	26
Team work in report preparation and oral presentation of a given plant physiological procedure	25
Non-directed study	48
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Written final examination (70%), including: -multiple choice questionnaires - short-answer questions - problem solving/ short-answer questions concerning laboratory practice Laboratory work and students lectures (30%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
1) Plant Physiology (5th edition) by L. Taiz, and E. Zeiger. Sinauer Associates, Inc.; 2010
2) Introduction to Plant Physiology, W. Hopkins & N. Huner, Greek translation, Broken Hill, 2020
3) Botany, J. Mauseth (6th edition), Greek translation, Broken Hill, 2020

- Related academic journals:
Plant Physiology
Plant Physiology and Biochemistry
Photosynthetica
The New Phytologist
Functional Plant Biology
Journal of Experimental Botany
Environmental and Experimental Botany

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Vasileios Antoniadis, Professor; Dr. Anastasia Angelaki (Laboratory Teaching Staff)

1. *GENERAL*

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΔΚ0408	**SEMESTER**	3rd (FALL)
COURSE TITLE	HYDRAULICS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Theory, Laboratory, and Tutorial Exercises		4	4 ECTS
COURSE TYPE	Compulsory		
PREREQUISITE COURSES:	Mathematics, Physics		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (In English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_176/		

2. LEARNING OUTCOMES

Learning outcomes
It is a basic course and constitutes an introduction to the concepts and problems of water science. The course is directed initially to familiarize students with the fundamental concepts of physical properties of fluids. Also, more specifically students are introduced to hydraulic problems, in order to have an overall understanding of the procedures and methodologies in solving similar problems. Theoretical training leads to the solution of practical problems associated with hydrostatic issues, hydrodynamics and transport of water in open and closed conduits serving the water supply or irrigation. Finally, the aim of the course is students to understand the importance of solving problems related to water and its movement and to work in modern society and launch evolution of Hydraulics to a distinct academic field. The course is a necessary background in order to study courses: "Irrigation", "Hydrology", "Water Resources Management", which are taught at undergraduate and postgraduate level. After the completion of the course, student is expected to: Specify, distinguish and classify hydrostatic problems, hydrodynamic problems and water movement in closed pipes problems. Be able to relate theoretical background with practical problems related to water science. Withdraw techniques and methods that correspond to each hydrostatic, hydrodynamic and water movement into closed pipes, problem. Be able to analyze, compare, calculate and find parameters relating to water science. Use methodologies within a realistic timetable. Be able to evaluate hydraulic studies of open and closed water transport networks. Be able to elaborate simple studies of open and closed water transport networks. Be able to attend relevant courses at postgraduate level. ● Look, use and analyze relevant literature.
General Competences

- Independent, autonomous work
- Natural environment respect
- Design and project management

3. SYLLABUS

Introduction (Physical properties of fluids, Surface tension, capillary phenomena). Hydrostatic (Hydrostatic pressure gauges, hydrostatic pressure on surfaces, Archimedes Principle, Problems). Hydrodynamics (Law of mass conservation, continuity equation, motion, Extension of Bernoulli theorem to real fluids. Energy Equation, Law of quantity drive conservation, Applications, Tube Pitot, Venturi Counter, Problems). Flow hydrometer through holes, valves, weir. Flow through closed tubes.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Learning process is supported by the electronic platform e-class.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory exercises and tutorials	26
Small individual practice work	26
Three intermediate examinations (advances)	22
Course total	**100**

STUDENT PERFORMANCE EVALUATION	I. Laboratory examinations (50% of the final grade). -Problem solving II. Theory examinations (50% of the final grade). -Theory

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Papamichail D., Babajimopoulos C. 2014. Applied Agricultural Hydraulics. Ziti publications (In Greek).
2. Schaum's Fluid Mechanics and Hydraulics, Theory and Problems
3. Terzidis G.A., Papazafeiriou Z.G, 1987. Agricultural Hydraulics. Ziti publications (In Greek).
4. Terzidis G.A., 1985. Hydraulics Courses. 1. General Hydraulics. Ziti publications (In Greek).
5. Terzidis G.A., 1985. Hydraulics Courses. 2. Closed pipes. Ziti publications (In Greek).

- Related academic journals:

Water Resources Management, Water Resources Research, Transport In Porous Media, Soil Science, Soil Science Soc. Am. J., Vadose Zone, Irrigation & Drainage, Water.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nikolaos Papadopoulos, Professor; Dr. Konstantinos Zarpas (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL STUDIES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK0205	**SEMESTER**	3rd (FALL)
COURSE TITLE	AGRICULTURAL ZOOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	GENERAL BACKGROUND, SPECIAL BACKGROUND,		
PREREQUISITE COURSES:	NONE		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (IN ENGLISH) TUTORING AND LECTURES		
COURSE WEBSITE (URL)	https://eclass.uth.gr/modules/contact/index.php?course_id=4549		

2. LEARNING OUTCOMES

Learning outcomes

This is the main introductory course to the science of Zoology with special emphasis on Agricultural Zoology covering respective taxa but insects.

The course aims at providing knowledge in the following subjects:

- Taxonomy and systematics.
- Evolution, the concept of species and speciation.
- Morphological, biological, behavioral and population characteristics of the main animal taxa.
- Principles of agricultural zoology
- Mites, nematodes, millipedes, earthworms, snails etc.
- Managing pests in agricultural settings cycles.

Students who complete the course will acquire knowledge of (a) the basic element regarding the major phyla of the animal kingdom, (b) animal taxonomy, systematics and classification, (c) the biology of the important to agriculture animal taxa but insects, (d) the pest management in an environmentally sound manner, (e) the basic methods followed to study pest population dynamics.

General Competences

- Biology
- Natural environment
- Working in an interdisciplinary environment
- Team work

3. SYLLABUS

- Introduction to Zoology – Phylla of the Animal Kingdom
- Systematics, taxonomy and classification
- Domains, Kingdoms, Phylla
- Porifera and Cnidaria
- Platyelminthes and Annelida
- Animal reproduction
- Development, life cycles and population biology
- Agricultural pests and and basic principles of pest management.
- Nematodes – parasitic nematodes
- Phytoparasitic nematodes
- Arthropods but insects
- Acarology
- Mites of agricultural importance
- Mollusca, snails
- Chordates, vertebrates of agricultural importance

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Distribution of power point presentations, i-books, video, quiz, Educational process is supported by the online platform e-class.
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>26</td></tr><tr><td>Laboratory exercises</td><td>26</td></tr><tr><td>Written assignment</td><td>78</td></tr><tr><td>**Course total**</td><td>**125**</td></tr></table>
STUDENT PERFORMANCE EVALUATION	I. Final examination (80%) ● multiple choice questions ● short answer questions ● written work on practical and theoretical fields II. Written assignment (20%) III. exams on subjects of the laboratory exercise (pass or fail) IV. the opportunity of midterm exams is offered

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
  - Hickman, C. P., L. Roberts, and A. Larson. 2015. Integrated principles of Zoology. Utopia Editions, Greece.
  - Prophetou, D. 2011. General and Applied Zoology. Giachoudis, Thessaloniki, Greece.
  - Emmanouel, N. 1998. Agricultural Zoology, Agricultural University of Athens, Athens, Greece.

- Related academic journals:
Annual Review Ecology, Evolution and Systematics

COURSE OUTLINE

COURSE COORDINATOR/INSTRUCTOR: Panagiotis Madesis, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΔΚ0403	**SEMESTER**	3rd (FALL)
COURSE TITLE	BIOCHEMISTRY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		2+2	4
COURSE TYPE	General background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_118/		

2. LEARNING OUTCOMES

Learning outcomes
1. Learning the structure and function of the basic biochemical pathways and cycles. 2. Training in basic biochemical laboratory techniques.
General Competences
1. Finding, analyzing and synthesizing data and other information, by utilizing the net browsers and other appropriate digital multimedia. 2. Group work. 3. Encouragement of free, creative and inductive thought.

3. SYLLABUS

1. Subcellular localization, order of metabolites involved, regulatory enzymatic steps, coenzymes involved of the following biochemical paths, including their interconnection:
   - Glyconeogenesis and pentose phosphate pathways.
   - Synthesis of lipids.
   - Tricarboxylic acid and glyoxylic acid cycles.
   - Nitrogen assimilation and aminoacid synthesis.
   - Synthesis of purines, pyrimidines and pteridines.
2. Bioenergetics of photosynthesis, oxidative phosphorylation and of the rest of the biochemical pathways.
3. Enzymatic mechanisms of selected regulatory steps of various biochemical paths.
4. Genetic information flow
5. Training in basic laboratory methods of biochemistry, such as the following:

- Isolation and separation of groups of plant constituents of small molecular weight (sugars, aminoacids, lipids, etc)
- Isolation of plant macromolecules (e.g. polysaccharites)
- Isolation and separation of proteins.
- Enzyme purification and enzymatic reactions.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Face-to-face (lectures in the class and lab exercises) using PowerPoint, distance learning (via the E-class course page)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Via E-class
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>26</td></tr><tr><td>Laboratory practice</td><td>26</td></tr><tr><td>Group work (essay writing)</td><td>23</td></tr><tr><td>Study and analysis of bibliography</td><td>25</td></tr><tr><td>Course total</td><td>100</td></tr></table>
STUDENT PERFORMANCE EVALUATION	1. Final examination on multiple choice questions, in Greek, including also laboratory practise themes and accounting for the 75% of the final grade (15% will be attribute to questions based to the lab). 2. Assays and public presentation of bibliographical work, accounting for 25% of the final grade.

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Διαμαντίδης Γ. 2017. Εισαγωγή στη Βιοχημεία. Εκδόσεις UNIVERSITY STUDIO PRESS - ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΙΑ ΓΡΑΦΙΚΩΝ ΤΕΧΝΩΝ ΚΑΙ ΕΚΔΟΣΕΩΝ. (In Greek)
2. Tymoczko John, Berg Jeremy, Stryer Lubert, 2018. Βιοχημεία-Βασικές αρχές. Εκδόσεις BROKEN HILL PUBLISHERS LTD. (In Greek)
3. Reginald H. Garrett, Charles M. Grisham, 2019. Βιοχημεία. UTOPIA ΕΚΔΟΣΕΙΣ Μ. ΕΠΕ. (In Greek)

- Related academic journals:

4th Semester (Spring)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Athanassios Sfougaris, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1000	**SEMESTER**	4th (SPRING)
COURSE TITLE	MANAGEMENT OF TERRESTRIAL ECOSYSTEMS		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures	2	
Laboratory exercises	2	
		5

COURSE TYPE	General background
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English) Tutoring and Lectures
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_143/

2. LEARNING OUTCOMES

Learning outcomes
✔ Understanding of management principles of terrestrial (natural and agricultural) ecosystems, ✔ Knowledge the sustainable management of species and ecosystems, ✔ Understanding of habitat and vegetation management, management of animals and their habitats, protection of rare species, ✔ Understanding of conservation biology principles, ✔ Knowledge of elaboration of management plans, special environmental studies and environmental impact assessment in terrestrial ecosystems.
General Competences
Decision-making Work independently Team work Respect of the natural environment Production of free, creative and inductive thinking

3. SYLLABUS

- Agroecosystems, forest and rangeland ecosystems, values and uses,
- Vegetation and fauna of terrestrial ecosystems,
- Factors affecting terrestrial ecosystems,
- Sustainable management of species and ecosystems,

- Management and use of plant diversity, especially of aromatic and medicinal plants,
- Management of habitats, vegetation, animals and their habitats, protection of rare species,
- Conservation biology principles,
- methodology of terrestrial ecosystem management,
- Management plans and special environmental studies,
- Environmental impact assessment.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Face to face in the classroom
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	● Use of ICT in teaching, e-class, ● Power point presentations, ● Communications with students via e-mail.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice	26
Educational visits-projects	6
Autonomous study	67
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Final written exams (80%). The final examination comprises short -answer questions and long-answer questions. Laboratory work evaluation (20%): Exams on laboratory practice content. Minimum passing grade=5 (A scale of 1 to 10 applies to the marks of each subject in the Hellenic Higher Education)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Paraskevopoulos S. 2019. Introduction to ecology and environmental sciences. Disigma editions.
2. Sfougaris A. 2012. Ecosystem management. University of Thessaly (in Greek).
3. Mazzoleni S., di Pasquale G., Mulligan M., di Martino P., Rego F. 2004. Recent dynamics of the Mediterranean vegetation and landscape. John Wiley &Sons, Ltd Sussex, England.

- Related academic journals:

Ecosystems, Journal of Ecosystems, International Journal of Ecosystem, International Journal of Biodiversity Science, Ecosystem Services & Management, Journal of Ecosystems and Management, Agriculture, Ecosystems & Environment.

COURSE OUTLINE

COURCE COORDINATOR: E. Vellios, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	BK1044	**SEMESTER**	4th (SPRING)
COURSE TITLE	GENERAL MICROBIOLOGY		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises	4	5 ECTS

COURSE TYPE	Detailed fundamental knowledge of specific concepts
PREREQUISITE COURSES:	General and Cell Biology, Genetics, Biochemistry.
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)
COURSE WEBSITE (URL)	-

2. LEARNING OUTCOMES

Learning outcomes
Introductory course. Aims of this course is the understanding of fundamental principles of microbiology, including the structural similarities and differences among microbes.
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Make decisions Respect natural environment Advance free, creative and causative thinking

3. SYLLABUS

Introduction. Diversity of microorganisms. Microbial cell structure and function. Microbial locomotion. Microbial metabolism. Microbial growth. Microbial ecosystems. Microbial bioremediation. Microbe-plant interactions. Microbial symbiosis. Microbial genetics. Microbial phylogeny. Introduction to virology. Bacteriophages, mycoviruses, plant viruses.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Power point presentations. Communication with ICT.
TEACHING METHODS	

Activity	**Semester workload**
Lectures	39

	Laboratory exercises	13
	Student independent work	73
	Course total	**125**
STUDENT PERFORMANCE EVALUATION	1. Lectures final written/oral exams (50%) 2. Laboratory final written/oral exams (50%)	

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Michael T. Madigan, Kelly S. Bender, Daniel H. Buckley, W. Matthew Sattley and David A. Stahl. (2019). Brock Biology of Microorganisms. Pearson.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Anestis Karkanis, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK0204	**SEMESTER**	4th (SPRING)
COURSE TITLE	SYSTEMATIC BOTANY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		5 (3+2)	5 ECTS
COURSE TYPE	Background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_173/		

2. LEARNING OUTCOMES

Learning outcomes
The aim of this course is to introduce the students to a theoretical and practical training in the description, identification, nomenclature and classification of plants. Upon completion of the course, students will be able to: 1. describe the basic principles of systematic botany. 2. understand the components of scientific names. 3. describe the structure and functions of different parts of plants. 4. identify selected plant families found in Greece. 5. identify certain genera and species found in Greece
General Competences
Retrieve, analyse and synthesise data and information, with the use of necessary technologies Work autonomously Work in teams Apply knowledge in practice Advance free, creative and causative thinking

3. SYLLABUS

I.	Principles of plant systematics.
II.	Plant nomenclature and classification.
III.	Plant identification.
IV.	Description of stems, leaves, flowers and fruits.
V.	Bryophyta division
VI.	Pteridophyta division
VII.	Classification of families of Spermatophyta (Gymnospermae and Angiospermae).
VIII.	Diagnostic characters of major families of the Greek flora.
IX.	Characteristic species of the main families of the Greek flora.

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>MODES OF DELIVERY</td><td>Class attendance</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Support of the learning process through the electronic platform e-class. Power point presentations. Student contact electronically.</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>Laboratory and field work</td><td>40</td></tr>
<tr><td>Homework: Organizing and presenting a plant collection (herbarium)</td><td>41</td></tr>
<tr><td>Autonomous study</td><td>20</td></tr>
<tr><td>Course total</td><td>125</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION40</td><td>1. Lectures: Final written exams (80%). The final examination comprises two types of questions: short - answer questions and multiple-choice questions.

2. Laboratory: Examination of the plant collection (20%)

Evaluation in Greek Language.
Evaluation criteria listed in the study guide.</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
1. Sarlis, G.P., 1999. Systematic Botany. Practice of cormofyta. Stamoulis Publisher, Athens. 1nd Edition (in Greek).
2. Stefanaki-Nikiforaki, M., 1999. Systematic Botany B. Stamoulis Publisher, Athens. 1nd Edition (in Greek).
3. Babalonas, D., Kokkini, S. 2004. Systematic Botany: Phylogenetic-Phenetic approach of plant taxonomy. Aivazis Publisher, Thessaloniki (in Greek).
4. Andreas Bartels, 2011. Mediterranean plants. ISBN: 9789604574681. pp.366 (in Greek).
5. Simpson, Michael G., 2010. Plant Systematics. Second Edition. Academic Press. pp/ 752 (in English).
6. Judd, Walter S., 2007. Plant Systematics. 3rd Edition. Sinauer Associates Inc. U.S pp. 565 (in English).

- Related academic journals:
Plant Systematics and Evolution, Systematic Botany, Australian Systematic Botany, Botany, American Journal of Botany.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nikolaos Katsoulas, Professor; Dr. Evaggelini Kitta (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	M0140	**Semester**	4th (SPRING)
COURSE TITLE	HYDROPONIC SYSTEMS		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises	4	5

COURSE TYPE	Specialized general knowledge
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_172/

2. LEARNING OUTCOMES

Learning outcomes

The course is a tool to introduce students to the concepts of design of hydroponic systems and of the necessary facilities.

Initially the concept of aerial and root environment are presented and the most significant parameters of the microclimate are discussed.

Then an attempt is done to introduce the various techniques and systems used in soilless cultivation. The characteristics of the substrates used in hydroponics are given and the methodology for dimensioning the necessary irrigation and fertilization systems of hydroponic crops is presented. In addition, the nutrient needs for hydroponic crops are presented and the necessary systems for management of the nutrient solution are analyzed.

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

• Understand the basic and critical features of hydroponic crops and soilless systems used.

• Understand the basic and critical features of the substrates used in hydroponics and how they are managed.

• Analyze the design steps of a hydroponic system.

General Competences

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Team work

3. SYLLABUS

Introduction

1. Introduction to the technique of hydroponics. Introductory concepts and definitions. Hydroponic systems, nutrient solution, acidity and electrical conductivity of the nutritive solution.
2. Advantages and disadvantages of hydroponic systems. Application areas of hydroponics.

Substrates hydroponic

3. Inorganic and organic substrates. Rockwool, perlite, pumice, peat, etc.
4. Physical and chemical characteristics of the substrates. Porosity, air permeability etc.

Movement of the nutrient solution

5. Movement of water from the substrate to the root and the plant. The environment of the root, osmotic potential, the movement of water to the plant transpiration and its role in the movement of the nutrient solution and nutrient.

Systems and equipment

6. Methods and hydroponic systems. Open and closed systems. Growing systems with and without substrate. Growing canals, tanks, pots etc.
7. Equipment for hydroponic crops. Irrigation system, collection system and recirculating nutrient solution.

Irrigation and fertilization

8. Irrigation of hydroponic crops. Water needs calculation.
9. Methods of irrigation scheduling. Irrigation by time, sunlight, moisture in the substrate, water status indicators in the plant and a combination of the above.
10. Nutrient solution preparation. Process for preparation of nutrient solution. Calculation of macronutrient needs.
11. Process for preparation of nutrient solution. Calculation of micronutrient needs. Systems for preparing nutrient solutions.
12. Automation and control systems.
13. Nutrient solution disinfection systems and methods. Disinfection with heat, ultraviolet radiation, using sand filters, etc.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Support of the learning process through the electronic platform e-class Specialized software for simulation of water needs in greenhouse crops
TEACHING METHODS	

Activity	Semester workload
Lectures	52
Individual exercises	15
Individual projects	12
Visits in commercial greenhouses	6
Non-directed study	40
Course total	**125**

STUDENT PERFORMANCE EVALUATION	I. Final written exam (80%) comprising: - Short Answer Questions - Problem solving II. Presentation of individual work (20%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Μαυρογιανόπουλος Γ.Ν., 2006. Υδροπονικές εγκαταστάσεις. Εκδόσεις Σταμούλη, Αθήνα (in Greek).

2. Savvas D. and Passam H., 2002. Hydroponic production of vegetables and ornamentals. Embryo publications, Athens, Greece.
3. Jones B. 2005. Hydroponics. CRC publications
4. Roberto K., 2003. How to hydroponics. www.howtohydroponics.com
5. Raviv, M. and Lieth J.H. 2007. Soilless Culture: Theory and Practice. Elsevier Science, 500 pages

- Related academic journals:
Scientia Horticulturae, HortScience, Acta Horticulturae, Biosystems Engineering, Transactions of the ASABE, Computers and Electronics in Agriculture

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nicholaos Danalatos, Professor, Kyriakos Giannoulis, Assistant Professor; Elpiniki Skoufogianni (Laboratory Teaching Staff); Dr. Dimitrios Bartzialis (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	SCHOOL OF AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	ΦΖ0602	**SEMESTER**	4th (SPRING)
COURSE TITLE	AGRONOMY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_126/		

2. LEARNING OUTCOMES

Learning outcomes
The aim of this course is to introduce the students to issues like: • the development of agriculture in modern Greece, • the relationship of cultivated plants to the environment. • effect of human activities to plants and • cultivation practices of the field preparation, of the sowing until the disposal of the product.
General Competences
Retrieve, analyse and synthesise data and information, with the use of necessary technologies Advance free, creative and causative thinking Project planning and management Respect for the environment

3. SYLLABUS

i. Introduction (importance of agriculture, development, natural resources, Greek agriculture
ii. Field crops (evolution-spread, classification, plant parts and physiological functions of plant productivity
iii. Plant and environment (territorial factors, climatic factors, energy factor, aqueous factor, atmospheric factor, biotic factors).
iv. Human impact on the plants (crop choice,choice culture system, seed choice, soil treatment, fertilization, nutrients, nitrogen, phosphorus, potassium, etc., Sowing-time, depth, ways, quantity, transplanting, cultivation practices of emergence until harvesting time
v. Harvesting – storage of products, trading, packaging and distribution of products

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Power point presentations. Student contact electronically.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory and field work	26
Autonomous study	73
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Final written exams (100%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Chris Dordas-General Agriculture. Publications MODERN EDUCATION. 1st Edition / 2009. ISBN978-960-357-088-2, Editor: Christina and Vasiliki Kordali OE, Type: Textbook
2. Karamanos Andreas., Principles of plant production on arable crops. Editor: Papazisis. 2nd Edition / 2011.
3. eclass, page https://eclass.uth.gr/courses/AGR_U_126/

- Related academic journals:

Agronomy Journal, European Agronomy Journal, Crop Science, International Journal of Agronomy, Journal of Agronomy and Crop Science.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Vasileios Antoniadis, Professor; Adjunct Teaching Staff; Dr. Anastasia Angelaki (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURAL CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1006	**Semester**	4th (SPRING)
COURSE TITLE	IRRIGATION I		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4 (2+2)	5 ECTS
COURSE TYPE	Scientific Area		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_108/		

2. LEARNING OUTCOMES

Learning outcomes
The students have to understand the theory of irrigation, so that to be able to: • Recall irrigation terms, combine them so as to describe and identify irrigation scheduling problems, water and irrigation network management. • Understand, perceive, explain simple and advanced cases of irrigation problems giving a gist of the results from their study. • Apply the irrigation theory to study the relationship of soil-plant-water, to calculate the reference and crop evapotranspiration, the irrigation dose, duration and interval. • Analyze the design and implementation of an irrigation project or water management or irrigation networks and irrigation systems. • Contribute effectively in optimal irrigation scheduling and application, through the optimal organization or reorganization and reconstruction of individual and collective irrigation networks. • Develop studies in irrigation system selection and its evaluation through the definition of measurable indices about the soil and environment parameters, their measurements and comparison.
General Competences
• Use of the necessary technical equipment in research, analysis and synthesis of data and information dealing with the design and management of irrigation projects. • Effective participation on decision making. • Work independently or in a team. • Efficient use of water ensuring the optimal Water Resource Management and Environmental Sustainability.

3. SYLLABUS

The water and the soil. Measurement of soil moisture, water movement in the soil. Soil water potential, soil hydrodynamic parameters, hysteresis. Soil infiltration of water. Available and useful soil moisture. Irrigation dose, duration of irrigation, irrigation interval, irrigation scheduling. Surface irrigation methods: flood, furrow, basins. Sprinkler, surface and subsurface drip irrigation. Developing irrigation projects.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	CD, email, Power Point, Department's Website
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Tutorial Exercises	26
Bibliography Review	26
Homework	25
Irrigation Studies	22
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Writing Examination in laboratory exercises in the end of Semester Writing Examination in theory in the end of Semester Homework Laboratory and Practical Exercises

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

Book [11157]: Agricultural Hydraulics G.A. Terzidis and Z. G. Papazafeiriou
Book [10992]: Principles and Practice of Irrigation, Z.G. Papazafeiriou

5th Semester (Fall)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Evangelos Vellios, Associate Professor; Dr. Fevronia Lioliopoulou (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	SCHOOL OF AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	BK1053	**SEMESTER**	5th (FALL)
COURSE TITLE	GENERAL PLANT PATHOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		5 (3+2)	5 ECTS
COURSE TYPE	Detailed fundamental knowledge of specific concepts with broad-based training		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_129/		

2. LEARNING OUTCOMES

Learning outcomes
Introduction to the science of Plant pathology, concepts and definitions. With the completion of the lectures, students will have the basic knowledge about ● the meaning of plant disease ● symptoms and signs of diseases ● the biology of plant pathogenic microorganisms ● non-parasitic diseases ● disease epidemics the control of a disease with sustainable agriculture practices
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Make decisions Work autonomously Respect natural environment Advance free, creative and causative thinking

3. SYLLABUS

Introduction to the science of Plant Pathology, concepts and definitions. Symptomatology, etiology and classification of phytopathogenic agents (fungi, prokaryotes, viruses, parasitic higher plants). Pathogenesis and epidemiology of parasitic diseases. Principles of diagnosis and control of plant disease. Morphology and identification of important pathogenic microorganisms.

Applications of macroscopic, microscopic and advanced diagnostics in plant pathology.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	In-person
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Powerpoint presentations. Student contact electronically.
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>39</td></tr><tr><td>Laboratory excercises</td><td>26</td></tr><tr><td>Student independent work</td><td>60</td></tr><tr><td>Course total</td><td>125</td></tr></table>
STUDENT PERFORMANCE EVALUATION	1. Lectures final written/oral exams (50%) 2. Laboratory final written/oral exams (50%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
1. Tjamos, E.K. (2004). 'Phytopathology'. Publisher: Stamoulis, Athens, Greece. (In greek)
2. Agrios, G.N. (2004). 'Plant Pathology'. 5th Edition. Academic Press, Inc., San Diego, California.
3. Schumann, G. & D Arcy C. (2006). 'Essential Plant Pathology Textbook and CD ROM'. The American Phytopathological Society, St Paul, Minnesota, USA.
4. Trigiano, R.N., Windham, M.T. and Windham, A.S. (2004). 'Plant Pathology Concepts and Laboratory Excercises'. CRC Press LLC, Boca Raton, USA.

- Related academic journals:
Plant Pathology, Plant Disease, European Plant Pathology, Phytopathology, Molecular Plant Pathology.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Georgios Nanos, Professor ; Persefoni Maletsika, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΕΦ0502	**SEMESTER**	5th (FALL)
COURSE TITLE	POMOLOGY I		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Specialised general knowledge		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_141/		

2. LEARNING OUTCOMES

Learning outcomes

The course is an introductory course to the science of tree fruit cultivation. The course material is destined to introduce the students to the basic understanding of botany and physiology of fruit tree and its parts, the relationship between tree and environment, the general knowledge of cultural practices applied in an orchard and postharvest handling of fruits.

The course also refers to basic knowledge on sustainable use of inputs, certification of fruit production, environmentally-friendly plant production, evaluation of cultural practices on tree performance, fruit quality, humans and environment, so that the student will complete his/her understanding about management of tree fruit production business. The course uses knowledge from various specialized courses related to plant production to practically apply them to fruit science. It is also the basic knowledge for more specialised courses in the syllabus.

Finally, the scope of the course is the development of global knowledge for tree functioning and the necessary sustainable practices to be applied to sustainable, environmentally-friendly fruit production.

With the completion of course requirements the student is able to:

- To understand the basic knowledge of pomology, as these are interconnected with the agricultural sciences particular subjects
- Has the basic knowledge of the tools and techniques to sustainable cultivation of fruit trees cultivated or able to be cultivated in Greece
- Has the capacity to explore, evaluate and use new knowledge from literature sources outside the ones used in the course
- Is able to study and discriminate the critical points needing improvements in an fruit tree company or study the establishment and guide the developers for a new tree fruit establishment to successful results

- Is in position to understand and evaluate the negative consequences from a biotic or abiotic factor to the crop and is able to find preventive or curative methods to avoid or minimize negative consequences
- Has the basic communication skills to interact with his/her co-students, instructor and various stakeholders in fruit tree cultivation matters.

General Competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Decision-making
Working independently
Team work
Working in an interdisciplinary environment
Project planning and management
Respect for the natural environment

3. SYLLABUS

i. Basic knowledge on tree botany, latin nomenclature, discrimination between families of cultivated tree species and their general characteristics
ii. Environment and fruit tree production
iii. Basic description, application and understanding of each cultural practice of fruit trees
iv. Environmentally-friendly cultivation methods for fruit trees and certification
v. Analysis of each cultural practice applied to pome fruit (apple, pear, quince) and the postharvest handling of their products
vi. Analysis of each cultural practice applied to stone fruit (peach, plum, apricot, cherry) and the postharvest handling of their products
vii. Evaluation of problems arising from the cultivation of the above mentioned fruit tree species and development-application of methods-techniques to avoid or reduce crop losses or fruit quality losses in the framework of environmentally-friendly cultivation to protect the environment, the non-target organisms and humans.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of powerpoint presentations in lectures, use of internet and electronic and hard-copy library resources for solving real-life problems
TEACHING METHODS	

Activity	Semester workload
Class teaching	26
Laboratory exercises	14
Field trips	8
Field exercises to Experimental Farm	12
Case study	15
Autonomous study	50
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Written examinations (70% to the final grade), oral examinations (10%), case study oral and written presentation (10%), participation and final exam to laboratory material (10%) The written exams consist of short answers to descriptive and real-life problem solving questions based on study material

	given as book and notes by the instructor and additional material available in the laboratory of Pomology and the departmental library.

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Georgios Nanos, General Pomology, Gartaganis Publ., Thessaloniki, p. 381.
2. M.D. Vasilakakis, General and Specific Pomology, Gartaganis Publ., Thessaloniki, 2004, p. 755
3. K.A. Pontikis, Specific Pomology, Vol. 1, Pome Fruits, Stamoulis Publ., Athens, 2003, p. 208
4. K.A. Pontikis, Specific Pomology, Vol. 2, Nuts - Stone Fruits - Other fruit trees, Stamoulis Publ., Athens, 1996, p.493
5. Instructor's notes on recent advances for the course subjects

- Related academic journals:

Hort Science, HortTechnology, Scientia Horticulture, Acta Horticulturae, Fruits, European J. Horticultural Science

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Anestis Karkanis, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΙΦ1004	**SEMESTER**	5th (FALL)
COURSE TITLE	WEED SCIENCE		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		4	5 ECTS
COURSE TYPE	Specialized general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_155/		

2. LEARNING OUTCOMES

Learning outcomes
This course aims to provide the most recent information regarding the weed biology and control, to provide knowledge on the basic uses, properties and mode of action of the most important groups of herbicides. Upon successful completion of this course, students will be able to: • identify the main weeds in Greece. • plan an effective weed control program in various crops. • be aware of herbicides applied in main crops. • be familiar with problems associated with herbicide use (eg. herbicide resistance and phytotoxicity, causes of herbicide injury)
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Make decisions Work autonomously Respect natural environment Advance free, creative and causative thinking

3. SYLLABUS

I. Weed biology (weed characteristics and classification, weed reproduction, dormancy, seed germination, weed seed dispersal).
II. Weed control methods.
III. Herbicides (classification and modes of action).
IV. Herbicide selectivity.
V. Herbicide formulation and application.

VI. Herbicide uptake and translocation in plants.
VII. The fate of herbicides in soils.
VIII. Weed control in tree crops, field crops and vegetables.
IX. Herbicide resistance.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Support of the learning process through the electronic platform e-class. Power point presentations. Student contact electronically.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory and field work	26
Homework: Organizing and presenting a weed collection (herbarium)	25
Autonomous study	48
Course total	**125**

STUDENT PERFORMANCE EVALUATION	1. Lectures: Final written exams (50%). The final examination comprises three types of questions: short - answer questions, long-answer questions and multiple-choice questions. 2. Laboratory: Final written exams (50%). The final examination comprises three types of questions: short - answer questions, long-answer questions and problem questions. Evaluation in Greek Language. Evaluation criteria listed in the study guide.

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Βασιλάκογλου Γ., Δήμας Κίτσιος, 2021. Σύγχρονη Ζιζανιολογία.. Εκδόσεις Χριστίνα και Βασιλική Κορδαλή Ο.Ε., 1η Έκδοση 2021 (In Greek).
2. Τραυλός Η., Κανάτας Π., 2022. Ζιζανιολογία και Γεωργία. Εκδόσεις ΠΕΔΙΟ ΕΚΔΟΤΙΚΗ, ΔΙΑΦΗΜΙΣΤΙΚΗ ΚΑΙ ΡΑΔΙΟΤΗΛΕΟΠΤΙΚΩΝ ΠΑΡΑΓΩΓΩΝ Α.Ε. 1η Έκδοση 2021 (In Greek).
3. Ελευθεροχωρινός Η.Γ. 2020. Ζιζανιολογία. Εκδόσεις ΕΚΔΟΤΙΚΗ ΑΝΩΝΥΜΗ ΕΤΑΙΡΕΙΑ ΑΓΡΟΤΙΚΟΥ ΤΥΠΟΥ, 5η Έκδοση/2020 (In Greek).
4. Λόλας Π., Ζιζανιολογία, Ζιζάνια-Ζιζανιοκτόνα, Τύχη και Συμπεριφορά στο Περιβάλλον. Εκδόσεις Σύγχρονη Παιδεία, 2η έκδοση /2007 (In Greek).
5. eclass, https://eclass.uth.gr/courses/AGR_U_155/

- Related academic journals:

Weed Science
Weed Research
Weed Technology
Weed Biology and Management
Crop Protection
Pest Management Science
Agronomy Journal
Crop Science
Field Crops Research
European Journal of Agronomy

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Vasileios Antoniadis, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΣΦ0602	**SEMESTER**	5th (FALL)
COURSE TITLE	SOIL FERTILITY – FERTILIZERS – PLANT NUTRITION		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		2 (2+2)	5 ECTS
COURSE TYPE	General background		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_140/		

2. LEARNING OUTCOMES

Learning outcomes
This module introduces the students to basic principles of soil fertility, and it consists of a teaching and a practical section. The teaching section aims at giving the students the basic principles of soil fertility management, the description of the main soil nutrients (potassium, nitrogen, phosphorus, sulphur, calcium, magnesium, as well as trace nutrients and heavy metals). Also to give them the principles of fertilizers (management and application). The practicals section aims at providing the skills to the students to carry out and understand the basic soil fertility laboratory analyses, such as the extraction and analysis of nitrogen, phosphorus, exchangeable cations, trace cations and boron. When students successfully complete this module, they should: ● Be familiar with the basic soil fertility principles. ● Know the properties on soil nutrients and their role in plants ● Be able to carry our laboratory analyses related to soil fertility
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 Team work Working in an international environment Working in an interdisciplinary environment Production of new research ideas

3. SYLLABUS

Teaching section

- Plant nutrients.
- Availability of potassium, calcium, magnesium, and phosphorus
- Soil nitrogen
- Micronutrients and heavy metals: Zn, Cu, Mn, Fe, B, Cd, Pb and Se.
- Estimations of nutrient availability to plants
- The use and practice of fertilizers
- Problems concerning soil fertility and fertilizers

Practicals section

Extraction and analysis of:

- Nitrogen
- Phosphorus
- Exchangeable cations K, Ca, Mg, and Na
- Cation micronutrients Zn, Cu, Mn, Fe
- Boron

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	● Teaching in the class with PowerPoint. ● Support of teaching activity via the e-class platform
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Practicals	26
Assignment on a topic related to soil fertility	35
Self-study	38
Course total	**125**

STUDENT PERFORMANCE EVALUATION	I. Written examinations (60%) II. Practicals (40%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1. «Εδαφολογία: Η Φύση και οι Ιδιότητες των Εδαφών», Brady, R.R. and Weil, N.C. (In Greek)
2. « ΓΟΝΙΜΟΤΗΤΑ ΕΔΑΦΩΝ» του ΙΚ Μήτσιου-Εκδόσεις Zymel (In Greek)
3. «ΓΟΝΙΜΟΤΗΤΑ ΕΔΑΦΩΝ» του Β. Κεραμίδα –Διδακτικές Σημειώσεις ΑΠΘ (In Greek)
4. «Εργαστηριακές Ασκήσεις» των Α. Δημήρκου –Ε.Ε.Γκόλια Διδακτικές Σημειώσεις ΠΘ (In Greek)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nikolaos Katsoulas, Professor; Dr. Evaggelini Kitta (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1005	**Semester**	5th (FALL)
COURSE TITLE	AGRICULTURAL CONSTRUCTIONS - GREENHOUSES		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises	4	5 ECTS

COURSE TYPE	Specialized general knowledge
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_135/

2. LEARNING OUTCOMES

Learning outcomes

The course is a tool for introducing students to the concept of greenhouse environment and greenhouse design and equipment.

Initially we attempt to introduce the concept of greenhouse environment and of the climate parameters that are mainly studied and controlled in greenhouses. The different types of greenhouses and of covering materials are presented and analyzed.

Then, an attempt is done to introduce the students in the methodology of ventilation, heating and cooling needs estimation in greenhouses and to the calculation of the necessary equipment to meet the above climate needs. At the same time, the irrigation needs of greenhouse crops are presented and the necessary capacity of irrigation systems is calculated.

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

• Understand the basic and critical features of the greenhouse microclimate characteristics.
• Understand the basic and critical features of the characteristics of the materials used to construct the frame and used for covering of greenhouses.
• Analyze the steps followed for the greenhouse design.
• Prepare a design study for a greenhouse and suggest the best equipment.

General Competences

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Team work

3. SYLLABUS

Introduction

1. Introduction to the course and presentation of objectives. General introduction for crops under cover. Historical evolution. Covered areas in Greece and Internationally.
2. Basic characteristics of Mediterranean greenhouses. Characteristics of Greek and Northern Europe greenhouses. Necessary equipment in Mediterranean greenhouses.

Technical Specifications of greenhouses

3. The greenhouse environment. Air temperature and relative humidity. Solar radiation. Concentration of CO_2.
4. Types of greenhouses. Basic types of greenhouses. Technical specifications for the construction of greenhouses. Specifications for ventilation and heating of greenhouses.

Frame and cover materials

5. Frame materials. Wood, steel, aluminium. Loads of greenhouse frame.
6. Greenhouse cover materials. Glass. Flexible plastic sheets. Hard plastic sheets.
7. Psychrometry. Enthalpy. Heating, cooling, dehumidification.

Greenhouse microclimate:

8. The greenhouse energy balance.
9. Greenhouse heating.
10. Greenhouse ventilation.
11. Greenhouse shading.
12. Greenhouse cooling.

Greenhouse Irrigation

13. Introduction. The water requirements of greenhouse crops.
14. Design of greenhouse irrigation systems

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Support of the learning process through the electronic platform e-class Specialized greenhouse microclimate simulation software
TEACHING METHODS	

Activity	Semester workload
Lectures	52
Individual exercises	12
Individual projects	9
Visits in commercial greenhouses	5
Non-directed study	47
Course total	**125**

STUDENT PERFORMANCE EVALUATION Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	I. Final written exam (79%) comprising: - Short Answer Questions - Problem solving II. Presentation of individual work (21%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Stanghellini, C., Ooster, B., Heuvelink, E., 2019. Greenhouses: Technologies for optimal production. Scientific editing: Nikolaos Katsoulas. ISBN 978-960-635-089-4, Publisher: Ekdoseis Pedio.

2. Tiwary G. N. 2005. Greenhouse Technology for controlled Environment. Alpha Science International Ltd.
3. Μαυρογιαννόπουλος Γ. 2005. Θερμοκήπια. Εκδόσεις Σταμούλη, Αθήνα.
4. Nelson PV. 2008. Greenhouse Operation and Management (7th Edition). Prentice Hall. ISBN-10: 0132439360
5. Boodley J. 2008. The Commercial Greenhouse (3rd Edition). CENGAGE Delmar Learning. ISBN-10: 1418030791
6. Hanan Joe J., 1997. Greenhouses: Advanced Technology for Protected Horticulture, CRC, 720 pages.
6. Stanhill G., Enoch H.Z., 1999. Greenhouse Ecosystems (Ecosystems of the World) Elsevier Science 436 pages.

- Related academic journals:
Biosystems Engineering, Transactions of the ASABE, Energy and Buildings, Applied Energy in Agriculture, Computers and Electronics in Agriculture

COURSE OUTLINE

COURSE COORDINATOR/INSTRUCTOR: Spyridon Petropoulos, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	POSTGRADUATE		
COURSE CODE	IΦ1007	**SEMESTER**	5th (FALL)
COURSE TITLE	VEGETABLE PRODUCTION I		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Specialised general knowledge and skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in Greek)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_161/		

2. LEARNING OUTCOMES

Learning outcomes

This course is the basic introductory course regarding the general principles of vegetable production and the cultivation of vegetables outdoors.

The first section of General Vegetable Production addresses the following topics: Introductory information relative to vegetable production science, the evolution and taxonomy of vegetable species. The economic significance and nutritional value of vegetables. The cultivation techniques and plant caring from sowing and propagation to harvesting, packaging and storage of vegetable species. Analysis of the relationship between vegetable production and environmental factors. The vegetables production and the environment (fertilization, soil and climate conditions, irrigation, diseases and pests control). Propagation methods (sexual and asexual). Vegetable storage and conservation. Postharvest processing of vegetables. Packaging and transportation of vegetables.

The second section of Specific Vegetable Production addresses the following topics: the best practice guides for cultivation of the most important vegetable species cultivated outdoors, whereas for each species is presented the most up-to-date information regarding their origin, evolution and economic importance, their morphology and botanical description, climate and soil requirements, cultivation practices, the most recent varieties and hybrids, and the most important pests and diseases is presented.

More specifically, the species included in this section are the following:

1. Solanaceae (potato, tomato, pepper, eggplant)
2. Cucurbitaceae (watermelon, melon, winter squash, cucumber)
3. Brassicaceae (broccoli, cauliflower, cabbage, Brussels sprouts, kohlrabi, radish)
4. Compositae (lettuce, chicory, endive, artichoke)
5. Liliaceae (onion, garlic, leek, asparagus)
6. Apiaceae (celery, carrot, fennel, parsley, dill)
7. Fabaceae (bean, pea, fava-bean)
8. Amaranthaceae (beet, chard, spinach)

9. Malvaceae (okra)

Regarding practical training of students, there are field laboratories at the experimental farm of the University were the students get acquainted and familiarised with the cultivation practices for the above species, as well as educational visits to local farms and practical projects in the field.

After the course conclusion the students will acquire skills and competence in order to:

- Know the requirements and best practice guides for vegetable cultivation
- Know the special soil and climate condition requirements, as well as the cultivation practices for outdoors production of the most important vegetable species
- Know how to propagate specific vegetable species
- Acquire the practical experience of growing vegetables as well as the plant growth and physiology of the most important vegetable species.

General Competences

- Team work
- Decision-making
- Working independently

3. SYLLABUS

General Vegetable Production

1. Introduction in basic principles of vegetable production, and the origin, evolution and taxonomy of cultivated vegetable species
2. Economic importance and nutritional value of vegetables
3. The vegetables production and the environment (fertilization, soil and climate conditions, irrigation, diseases and pests control)
4. Propagation methods (sexual and asexual)
5. Vegetable storage and conservation
6. Postharvest processing of vegetables
7. Packaging and transportation of vegetables
8. Diseases and pests control
9. Weed control

Specific Vegetable Production

10. Solanaceae (potato, tomato, pepper, eggplant)
11. Cucurbitaceae (watermelon, melon, winter squash, cucumber)
12. Brassicaceae (broccoli, cauliflower, cabbage, Brussels sprouts, kohlrabi, radish)
13. Compositae (lettuce, chicory, endive, artichoke)
14. Liliaceae (onion, garlic, leek, asparagus)
15. Apiaceae (celery, carrot, fennel, parsley, dill)
16. Fabaceae (bean, pea, fava-bean)
17. Amaranthaceae (beet, chard, spinach)
18. Malvaceae (okra)

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The course is supported by e-class and web-class platform
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice-fieldwork-practical experience	26
Educational visits-projects	10

	Non-directed study	63
	Course total	**125**
STUDENT PERFORMANCE EVALUATION	Evaluation in Greek language Lectures Conclusive written exams with open-ended and short-answer questions Laboratory Conclusive written exams with open-ended and short-answer questions	

5. ATTACHED BIBLIOGRAPHY

1. Γενική λαχανοκομία και υπαίθρια καλλιέργεια λαχανικών, 2014. Χα, Α., Πετρόπουλος Σ., Πανεπιστημιακές Εκδόσεις Θεσσαλίας, Βόλος, σελ. 711. ISBN: 978-960-9439-24-4.
2. 'Γενική Λαχανοκομία', 2003. Κανάκης, Α. Γ., Εκδόσεις Αγροτύπος α.ε.

6th Semester (Spring)

COURSE OUTLINE

COURSE COORDINATOR/INSTRUCTOR: Panagiotis Madesis, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1017	**SEMESTER**	6th (SPRING)
COURSE TITLE	BIOTECHNOLOGY-MOLECULAR BIOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		2+2	5 ECTS
COURSE TYPE	General background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_177/		

2. LEARNING OUTCOMES

Learning outcomes

Learning the basic mechanisms of action and the structure of the genetic material, with emphasis on their evolution. More specifically the following are included:

1. The enzymatic processes of nucleic acid multiplication/synthesis and protein synthesis.
2. The evolutionary appearance and form of the various types of nucleic acids (transposons, viruses, plasmids, circular and linear chromosomes)
3. Mechanisms of regulation of gene expression, signal transduction, translation factors, interactions between proteins and nucleic acids and between nucleic acids themselves.
4. Changes in nucleic acid structures (RNA processing, recombination).
5. Biotechnological approaches on high added value product development
6. Training in basic molecular biology techniques (nucleic acid extraction, electrophoresis, construction of recombinant vectors, methods of genetic transformation).

General Competences

1. Finding, analyzing and synthesizing data and other information, by utilizing the net browsers and other appropriate digital multimedia.
2. Group and individual work.
3. Encouragement of free, creative and inductive thought.

3. SYLLABUS

Lecture subjects

- Structure of RNA, DNA and protein
- Synthesis of DNA from DNA and DNA from RNA
- Synthesis of RNA from DNA (transcription)
- Protein synthesis (translation)

- Types of genetic material (plasmids, transposons, viruses, viroids, retrons)
- Types of genetic material (mitochondrial and plastid DNA, bacterial DNA, eukaryotic DNA)
- Regulation of gene expression-signal transduction.
- Changes on RNA structure (polyadenylation, capping, editing, intron removal)
- DNA recombination.
- Interactions between proteins and RNA and between proteins themselves.
- Biotechnological applications in agriculture
- Epigenetic regulation of gene expression
- Gene editing

Lab training

- Isolation of eukaryotic DNA
- Quantification of nucleic acids
- Cultivation of bacteria and plasmid isolation
- Genetic transformation of bacteria
- Isolation of RNA
- Agarose gel electrophoresis

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Face-to-face (lectures in the class and lab exercises) using PowerPoint, distance learning (via the E-class course page)
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Via E-class
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice	26
Group work (essay writing)	28
Study and analysis of bibliography	45
Course total	**125**

STUDENT PERFORMANCE EVALUATION	1. Final examination on multiple choice questions, in Greek, including also laboratory practise themes and accounting for the 75% of the final grade (15% of the grade will be attributed to lab based questions). 2. Assays and public presentation of bibliographical work, accounting for 25% of the final grade

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Burton E. Tropp, 2014. Βασικές Αρχές Μοριακής Βιολογίας. ΑΚΑΔΗΜΑΪΚΕΣ ΕΚΔΟΣΕΙΣ Ι. ΜΠΑΣΔΡΑ & ΣΙΑ Ο.Ε. (In Greek)
2. James Watson, Tania Baker, Stephen Bell, Alexander Gann, Michael Levine, Richard Losick, 2015. Μοριική βιολογία του γονιδίου. UTOPIA ΕΚΔΟΣΕΙΣ Μ. ΕΠΕ. (In Greek)

- Related academic journals:

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Ourania Pavli, Associate Professor; Evangelia Panagiotaki (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΘΦ0902	**SEMESTER**	6th (SPRING)
COURSE TITLE	PLANT BREEDING		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		4	5 ECTS
COURSE TYPE	Specialised general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_124/		

2. LEARNING OUTCOMES

Learning outcomes
Level 6: Basic principles of plant breeding. Main methods in plant breeding. Upon successful completion of the course, the student is expected to: ● understand the principles of heritability ● design a breeding plan for the improvement of a qualitative/quantitative trait in an autogamous or allogamous crop species ● be familiarized with laboratory techniques employed in plant breeding
General Competences
Working independently Production of new research ideas Project planning and management Respect for the natural environment

3. SYLLABUS

- Origin, evolution and mating systems of crop plants with respect to genetic variability. Introduction and exploitation of genetic material. Gene pool. Genetic basis of plant breeding.
- Genetic structure of autogamous and allogamous plant populations. Quantitative traits. Heritability. Response to selection. Inbreeding depression and heterosis.
- Breeding of autogamous species: Mass selection. Pure line breeding. Pedigree selection. Single seed descent. Backcross. Multiline varieties. Bulk population breeding.

- Breeding of allogamous species: Recurrent selection for intrapopulational and interpopulational breeding. Methods for the production and exploitation of hybrid varieties. Methods for the production and exploitation of synthetic varieties.
- Pollination control systems: Self incompatibility. Male sterility.
- Biotechnological approaches in Plant Breeding: In vitro techniques. Molecular Breeding. Genetic engineering.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	● Use of ICT in teaching ● Teaching support by e-learning platform ● Communication with students (e-mails)
TEACHING METHODS	

Activity	Semester workload
Lectures/interactive teaching	26
Laboratory practice	26
Study	73
Course total	125

STUDENT PERFORMANCE EVALUATION	Written final examination (100%), including: ● multiple choice questions ● short-answer questions ● questions concerning laboratory practice Evaluation in Greek Language (and English upon request).

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Δημήτριος Γ. Ρουπακιάς: Γενετική Βελτίωση Φυτών, University Studio Press.
2. George , Αρχές Γενετικής και Βελτίωσης των Φυτών, Utopia Publishing
3. Rex Bernardo: Breeding for Quantitative Traits in Plants, Stemma Press.
4. B.D. Singh: Plant Breeding, Kalyani Publishers.

- Related academic journals:

Plant Breeding, Frontiers in Plant Science-Plant Breeding, Crop Science, Euphytica, Molecular Breeding, Transgenic Research

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nikolaos Papadopoulos, Professor; Dr. Konstantinos Zarpas (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL STUDIES		
ACADEMIC UNIT	DEPARTMENT AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΦΖ0603	**SEMESTER**	6th (FALL)
COURSE TITLE	GENERAL ENTOMOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5
COURSE TYPE	SPECIAL BACKGROUND, GENERAL BACKGROUND		
PREREQUISITE COURSES:	NONE		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (IN ENGLISH) TUTORING AND LECTURES		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_127/		

2. LEARNING OUTCOMES

Learning outcomes

This is the main introductory course to the science of Entomology and Pest Management.
The course aims at providing knowledge in the following subjects:

- Biology and particularities of insects' life cycles
- structure and function of insect organic systems
- insect reproduction and communication
- movement and dispersion of insects
- interaction of insects and other living forms
- principles of pest management with emphasis on the agricultural ecosystem

and at developing basic competence on insect taxonomy and classification at least up to the family level.

Students who complete the course will acquire knowledge of (a) the basic element of insect biology, physiology, ecology, behavior and pest management, and (b) the importance of insects for the function of natural, agricultural and urban ecosystems. They will also acquire skills on identification of insects and they will be able to use tools and methods for monitoring the occurrence and population dynamics of insect pests.

General Competences

- Zoology, Agricultural Zoology
- Natural environment
- Working in an interdisciplinary environment
- Team work

3. SYLLABUS

- Introduction to Entomology. Importance of insects
- Exosceleton, cuticula and ecdysis
- Anatomy, circulatory and respiratory systems
- Nervous and endocrine systems
- Muscual system
- Insect sensilla and senses
- Reproductive system and reproduction
- Insect development, life cycles and voltinism
- Systematics and taxonomy
- Ametabola and Hemimetabola
- Holometabola
- Plant insect interactions
- Introduction to insect ecology.
- Introduction to strategies and methods of pest management

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Distribution of power point presentations, i-books, video, quiz, Educational process is supported by the online platform e-class.
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>26</td></tr><tr><td>Laboratory exercises</td><td>26</td></tr><tr><td>Field – educational trip</td><td>10</td></tr><tr><td>Insect collection</td><td>63</td></tr><tr><td>Course total</td><td>125</td></tr></table>
STUDENT PERFORMANCE EVALUATION	I. final examination (70%) ● multiple choice questions ● short answer questions ● written work on practical and theoretical fields II. insect collection (30%) III. exams on subjects of the laboratory exercise (pass or fail) IV. the opportunity of midterm exams is offered

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Tzanakakis, M. E. and Koveos, D. 2018. Entomology. 2nd Ed., University Studio Press, Thessaloniki, Greece.
- Chapman, R. 2007. The insects: structure and functions. Gambrige University Press
- Gullan, P.J. and P.S. Cranston. 2016. The Insects: an outline of Entomology. Blackwell, Hong Kong. 2nd Greek transl Ed. Parisianou

- Related academic journals:

Annual Review of Entomology

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Olga Gortzi, Professor; Evlalia Koufostathi (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΦΖ081	**ΕΞΑΜΗΝΟ ΣΠΟΥΔΩΝ**	6th (SPRING)
COURSE TITLE	FOOD TECHNOLOGY AND PROCESSING OF AGRICULTURAL PRODUCTS		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises	4	5 ECTS

COURSE TYPE	Specialised general scientific knowledge
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_200/

2. LEARNING OUTCOMES

Learning outcomes

The course learning outcome is general scientific knowledge in Food Science.
The target of the course is the application of food science to the selection, preservation, processing, packaging, distribution, and use of safe, nutritious, and wholesome food. This course will introduce the students into the novel technologies and also into the recycling of food packaging which is very important due to the huge problem of environmental pollution.

The students with the successful completion of the course will be able to:

- Understand the major principles, which are responsible for the production of safe and nutritious food.
- Propose the best technology for the process and manufacturing of agricultural products according to the combination of their components
- Propose the best packaging for raw and processed foods.

General Competences

- Working independently
- Team work
- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Production of free, creative and inductive thinking
- Project planning and management

3. SYLLABUS

The content of this course is:

- Introduction in Food Technology
- Additives and Foods

- Principals of food canning, pasteurization, sterilization.
- Heating of Food - Freezing of Food, Food Packaging,
- High Pressure and Food,
- Food Irradiation,
- Food Dehydration
- Food Packaging – Materials of Food Packaging - Interactions Food-Packaging
- Modified Atmosphere Packaging,
- Time Temperature Integrators (TTI), Control Packaging,
- Novel techniques in food packaging.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Face-to-face, in class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of ICT in teaching, laboratory education, communication with student
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice, in the basic principles of food safety and quality assurance	16
Study and analysis of bibliography-team work (project)	10
Educational visits / Individual projects	10
Student's study hours	63
Course total	**125**

STUDENT PERFORMANCE EVALUATION	I. Final written exams (multiple choice questionnaires, short-answer questions) or/and II. Team work (project) – presentation III. Laboratory work

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Μπλούκας Γ.Ι. 2017. Επεξεργασία και Συντήρηση τροφίμων. Εκδόσεις UNIBOOKS ΙΚΕ. (In Greek)
2. Αρβανιτογιάννης Ιωάννης Σ., Μποσνέα Λουλούδα Α. 2001. Στοιχεία τεχνολογίας, μεταποίησης και συσκευασίας τροφίμων. Εκδόσεις UNIVERSITY STUDIO PRESS - ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΙΑ ΓΡΑΦΙΚΩΝ (In Greek)

- Related academic journals:

COURSE OUTLINE

COURSE COORDINATOR/INSTRUCTOR: Spyridon Petropoulos, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	POSTGRADUATE		
COURSE CODE	ΙΦ1003	**SEMESTER**	6th (SPRING)
COURSE TITLE	VEGETABLE PRODUCTION II		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5
COURSE TYPE	Specialised general knowledge and skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in Greek)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_162/		

2. LEARNING OUTCOMES

Learning outcomes

This course addresses the cultivation techniques of the main annual vegetable crops grown in greenhouses in Greece and presents information regarding the practice guides of nine vegetables (tomato, pepper, aubergine, squash, cucumber, melon, water melon, beans, lettuce) that are cultivated in greenhouses and have economic importance in Greece.

In addition there is detailed information regarding the cultivation of aromatic vegetables , their origin and evolution, their taxonomy, their morphology and botanical description, the most important cultivars and varieties and the most common diseases and pests.

The course syllabus aim to familiarize the students with the basic principles of the following topics:

- The cultivation practices of the most important vegetable species that are cultivated in the greenhouse, their taxonomy, evolution, origin and botanical description.
- The physiology of growth and production of the abovementioned species.
- The soil and climate requirements of the abovementioned species.
- The propagation techniques and the practices related to sowing, harvesting, postharvest processing and storage of the abovementioned vegetables.
- The hydroponic cultivation system for vegetable production: introduction, recent advances, substrates, nutrient solutions, hardware and cultivation systems,
- The cultivation techniques of the most important aromatic vegetables being cultivated in Greece. Taxonomy, origin, evolution and botanical description of aromatic vegetables. Physiology of growth and production. Soil and climate requirements, irrigation and nutrient management. Propagation and cultivation techniques, harvest, postharvest processing and storage, pests and diseases.

Training: there will be practical training of students in the greenhouses at the experimental farm of the University were they will get acquainted and familiarised with the cultivation practices for the above species, as well as educational visits to local greenhouses and aromatic vegetables farms.

After the course conclusion the students will acquire skills and competence in order to:

- Know the requirements and best practice guides for vegetable cultivation in greenhouses.
- Know the special soil and climate condition requirements, as well as the cultivation practices for greenhouse production of the most important vegetable species and the cultivation of the most important aromatic vegetables.
- Know how to propagate specific vegetable species
- Acquire the practical experience of growing vegetables as well as the plant growth and physiology of the most important vegetable species.

General Competences

- Team work
- Decision-making
- Working independently

3. SYLLABUS

The topic of Vegetable Production in Greenhouse addresses the cultivation practice guides for the greenhouse production of tomato, pepper, eggplant, cucumber, watermelon, melon, winter squash, bean, lettuce.
For each vegetable the following topics are presented: information regarding the origin, evolution and economic importance of the species, the morphology and botanical description, climate and soil requirements, cultivation practices, the most recent varieties and hybrids, and the most important pests and diseases.

The topic of Aromatic Vegetables addresses the cultivation practice guides for anise, basil, borage, caper, celery, chervil, chive, coriander, cress, dill, fennel, ginger, parsley, peppermint, rocket, savory, spearmint, watercress.
For each vegetable the following topics are presented: information regarding the origin, evolution and economic importance of the species, the morphology and botanical description, climate and soil requirements, cultivation practices, the most recent varieties and hybrids, and the most important pests and diseases.

Laboratory: there will be practical training of students in the greenhouses at the experimental farm of the University where they will get acquainted and familiarised with the cultivation practices for the above species, as well as educational visits to local greenhouses and aromatic vegetables farms.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The course is supported by e-class and web-class platform
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice-fieldwork-practical experience	26
Educational visits-projects	10
Non-directed study	63
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Evaluation in Greek language Lectures Conclusive written exams with open-ended and short-answer questions Laboratory

	Conclusive written exams with open-ended and short-answer questions

5. ATTACHED BIBLIOGRAPHY

1. 'Αρωματικά φυτά με λαχανοκομική χρήση', 2015. Πετρόπουλος. Σ. Εκδόσεις Έμβρυο, Αθήνα (in Greek).
2. 'Η Τεχνική της καλλιέργειας των Κηπευτικών στα Θερμοκήπια', 2001. Ολύμπιου, Χ. Μ., Εκδόσεις Σταμούλη Α.Ε., Αθήνα (in Greek).
3. 'Καλλιέργεια λαχανικών στο θερμοκήπιο,' 2004. Κανάκης, Α. Γ., Εκδοτικός οίκος: Σταμούλη Α.Ε. (ΚΩΔΙΚΟΣ: 9603515175) (in Greek).

7th Semester (Fall)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nicholaos Danalatos, Professor; Kyriakos Giannoulis, Assistant Professor; Dr. Elpiniki Skoufogianni (Laboratory Teaching Staff); Dr. Dimitrios Bartzialis (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	ΖΦ0701	**SEMESTER**	7th (FALL)
COURSE TITLE	Field Crops I		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5
COURSE TYPE	Background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_148/		

2. LEARNING OUTCOMES

Learning outcomes
The aim of this course is student acquaintance to below issues: ● cereals which are divided into winter (wheat, barley, oat, rye, triticale), ● spring cereals (corn, sorghum, millet, rice) ● legumes divided into winter (vetch, pea, winter vetch, lentil, chickpea, lupin) and ● spring legumes (soybean, groundnut, beans) and ● forage plants grown for hay production (feed) and divided into grasses and legumes including annual and perennial legumes such as alfalfa.
General Competences
● Retrieve, analyse and synthesise data and information, with the use of necessary technologies ● Advance free, creative and causative thinking ● Project planning and management ● Respect for the environment ● Working independently ● Team work

3. SYLLABUS

Special Agriculture I examine three (3) groups of plants: i.) Grains divided into • winter (wheat, barley, oat, rye, triticale), and • Spring (corn, sorghum, millet, rice). ii.) Leguminous plants divided into • Winter (vetch, pea, winter vetch, lentil, chickpea, lupin) and

• Spring (soybean, groundnut, beans).
iii.) forage crops grown for hay production (feed) and divided into
• grasses and
• legumes including annual and perennial such as alfalfa.
For each plant growing there are sufficient details: General information (origin, economic importance, etc.), Botanical features (morphology, development, classification, description, etc.), Varieties (hybrids), Ecological requirements (soil and climatic conditions) Cultivation practices (crop rotation, treatments, seeding, fertilizing, irrigation, harvesting, etc.), Pests and diseases, technology and products

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Power-point presentations. Student contact electronically.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory and field work	26
Homework: Organizing and presenting a cultivation	16
Autonomous study	57
Course total	**125**

STUDENT PERFORMANCE EVALUATION	1. Lectures: Final written exams (60%) 2. Laboratory: Final written exams (40%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
1. Papakosta - Tasopoulou Despina . 2012. Special Agriculture, Grains and Legumes. Publications Modern Education.
2. eclass, page https://eclass.uth.gr/courses/AGR_U_148/

- Related academic journals:
Agronomy Journal, European Agronomy Journal, Crop Science, International Journal of Agronomy, Journal of Agronomy and Crop Science.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nikolaos Katsoulas, Professor; Dr. Christos Cavalaris (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEAPRTEMENT OF CROP SCIENCE AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΦΖ0503	**SEMESTER**	7th (FALL)
COURSE TITLE	FARM MECHANIZATION		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
	Lectures and Laboratory	2+2	5 ECTS
COURSE TYPE	Special background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_138/		

2. LEARNING OUTCOMES

Learning outcomes

This is an introducing course in farm mechanization. It targets to introduce the students on the basic aspects of agricultural machinery starting with a preliminary contact with the basic categories of agricultural implements and taking over a survey about agricultural mechanization and its future prospects.

The students have the opportunity to learn the structure and the basic operation functions of a series of farm equipment such as tillage implements, sowing equipment, fertilizers, sprayers etc. as well as the expected results from their use.

The students also learn about the basic structure, the systems and the capabilities of the farm tractors.

The main target of the course is to provide the students with the necessary skills to recognize and understand the functionality of the most common machinery used today in agricultural production, to provide them the ability to choose the appropriate implements and to be able to suggest the appropriate adjustments according to the varying working conditions.

General Competences

The scope of the course is to give the students the appropriate knowledge in order to get able:

- To identify the various agricultural implements.
- To get knowledge about the different parts of the implements and the specific role of each one.
- To get able to choose the appropriate settings
- To be able to advice the framers on choosing agricultural implements.

3. SYLLABUS

Introduction to agricultural mechanization – History of farm mechanization – The farm tractor and its use: evolution, types of tractors, chracteristics, basic issues - Internal combustion engines: characteristics, function, systems: system of fuel feed – engine cooling system, electrical system - Farm tractor functional systems – power chains – power take off – steering system – break system – linkage systems – Tires – Soil tillage and soil tillage implements – Importance of soil tillage – Primary soil tillage implements – Secondary soil tillage implements – PTO powered tillage implements – Crop establishment implements: Basic methods of crop establishment - Sowing – Drills – Planters – Transplanters – Farm conditioning implements: Sprayers, Fertilizer applicators, Manure applicators.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Teaching support via the e-class platform
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Practicing and exercises in small groups focusing on the application and implementation of PA techniques.	26
Private studying	73
Course total	**125**

STUDENT PERFORMANCE EVALUATION	1. Test examinations (50%) 2. Practical examinations (50%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Tsatsarelis K.A. (2011). Farm tractors. Giahoudi puplications, Thessaloniki.
- Tsatsarelis K.A. (2000. Principles of soil tillage and sowing, Giahoudi publications, Thessaloniki.

- Related academic journals:

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Nikoletta Ntalli, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΣΦ0601	**SEMESTER**	7th (FALL)
COURSE TITLE	AGRICULTURAL PHARMACOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		4	5
COURSE TYPE	Specialized general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_216/		

1. LEARNING OUTCOMES

Learning outcomes

This course aims to provide the most recent information regarding the novel EU legislation regarding pesticide regulation, to provide knowledge on the basic uses, properties and mode of action of the most important groups of pesticides and to provide the most fundamental knowledge on environmental fate and behavior of pesticides.

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

- known the basic principles and concepts of agricultural pharmacology.
- describe different pesticide formulations and the appropriate equipment for their use.
- Known the most important groups of pesticides and their use in agriculture and horticulture.
- be familiar with problems associated with pesticide use.

General Competences

Retrieve, analyse and synthesise data and information, with the use of necessary technologies
Work autonomously
Work in teams
Apply knowledge in practice
Respect natural environment
Advance free, creative and causative thinking

2. SYLLABUS

I. Brief history of pesticide science over the years. Presentation of the basic elements of EU Legislation regarding pesticide regulation.
II. Formulation of plant protection products. Elements of Pesticide Toxicology (Acute, chronic toxicity, Endocrine disrupting effects).
III. Description of Uses, Mode of Action, Properties and Environmental Fate for the main pesticide groups according to target-organism.

IV.	Insecticides: Organophosphates, Carbamates, Pyrethroids, Neonicotinoids, Natural Products, Growth Inhibitors. Acaricides: Organochlorines, Mitochondrial Respiration Inhibiting substances, Growth Inhibitors. Nematicides: Fumigants (Methyl-Isothiocyanate precursors, 1,3-D) Non-fumigants (Organophosphates, Carbamates).
V.	Fungicides: Non systemic (Copper based), Systemic (Phenylalanines, Benzimidazoles) and Antipathogenic substances (Acibenzolar – S- methyl, Melanin biosynthesis inhibitors) etc.
VI.	Herbicides: Hormone-Disrupting herbicides, Photosynthesis inhibitors (I and II), Carotenoid biosynthesis inhibitors, Aminoacid biosynthesis inhibitors etc.

3. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Support of the learning process through the electronic platform e-class. Power point presentations. Student contact electronically.
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>26</td></tr><tr><td>Laboratory and field work</td><td>26</td></tr><tr><td>Research Work</td><td>18</td></tr><tr><td>Autonomous study</td><td>55</td></tr><tr><td>Course total</td><td>125</td></tr></table>
STUDENT PERFORMANCE EVALUATION	1. Final written exams (90%). The final examination comprises four types of questions: short -answer questions, long-answer questions, multiple- choice questions and problems questions. 2. Group work (10%). 3. Minimum passing grade=5 (A scale of 1 to 10 applies to the marks of each subject in the Hellenic Higher Education) Evaluation in Greek Language. Evaluation criteria listed in the study guide.

4. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Ziogas V. Markoglou A. Agricultural Pharmacology: Biochemistry, Physiology, Mode of action and Uses of Plant Protection Products, Athens 2007.
2. Papadopoulou-Mourkidou E., Pesticides: Chemistry, Pharmacology, Toxicology, Ecotoxicology, Fate and Behaviour in the Environment, Metheksis Ed., 2008.

- Related academic journals:

Pest Management Science
Crop Protection
Weed Technology
Weed Biology and Management
Plant Protection Science
Phytoparasitica

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Christos Lykas, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK 1051	**SEMESTER**	7th (FALL)
COURSE TITLE	FLORICULTURE I		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Special background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes in English		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_107/		

2. LEARNING OUTCOMES

Learning outcomes
This course concerns the greenhouse and outdoor commercial production of the main cut and pot flower species. The course aims to provide knowledge concerning to: - Cultural practices and greenhouse environment management for ornamentals production, - Ornamentals physiology and morphology, - Ornamentals propagation material, - Ornamentals fertilization and irrigation requirements, - New techniques and methods for ornamental production. - The management of modern ornamental production units.
General Competences
Decision-making Working independently Team work Working in an international environment Search for, analysis and synthesis of data and information, with the use of the necessary technology

3. SYLLABUS

- Principles on flower plant physiology.
- Production of floriculture crops in the greenhouse and open field environment.
- Identify and define environmental factors that regulate growth and flowering of floriculture crops.
- Strategies and methods for commercial production of Rose, Carnation, Chrysanthemum, Lilium, Azalea, Gardenia, Cyclamen, Gerberas, Begonia.
- Hydroponic production of harvested flowers and crop management.

- Scheduling and controlling crop growth for target market periods.
- Postharvest treatments of harvested flowers.
- Physiological diseases.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	e-class facilities
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice	26
Fieldwork	25
Seminars	5
Educational visits	18
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Language of evaluation : Greek Final written exams (70%) performed dy: - short-answer questions - multiple choice questionnaires, , Laboratory exams (30%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Roy A. Larson. Introduction to Floriculture, Second Edition, Academic Press, 1992.
2. BOODLEY, J. Commercial FlorivultureII Ornamental crops, ION, Athens 1999.
3. Savvas Dimitrios. Principles in Floriculture, EMBRYO Pub., Athens 2003.
4. Christos Panagopoulos, Floriculture plants diseases, STAMOULIS Pub., Athens 2003.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Ourania Pavli, Associate Professor; Evangelia Panagiotaki (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1025	**SEMESTER**	7th (FALL)
COURSE TITLE	SEED PHYSIOLOGY, ECOLOGY AND TECHNOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_181/		

2. LEARNING OUTCOMES

Learning outcomes
An introduction to the basic knowledge of seed physiology, ecology and technology aiming to produce high quality seeds.
General Competences
● Search for, analysis and data and information, with the use of the necessary technology ● Team work ● Project planning and management ● Production of free, creative and inductive thinking

3. SYLLABUS

Description of the physiological, biochemistry, genetic and morphological processes of seed development as modified by the environment from anthesis to maturity. Floral Biology - development and structure of megasporangium - microsporangium, male and female gametophyte - palaenological studies - pollination mechanism-handling-management-culturing-separation of somatic embryoid and production of synthetic seed-development in typical monocots and dicots-apomictic seed formation. Apply introductory principles of biochemistry and physiology to the processes controlling seed viability. List those seed harvesting and conditioning factors that contribute to seed deterioration and vigour. Identify and use seed conditioning equipment. Seed Formation and Development, identify seed morphological structures. Seed Chemistry, identify the chemical structure of seed carbohydrates, lipids, proteins and describe the types of chemical compounds found in seeds. List the factors that influence the chemical composition of seeds. Seed Germination: identify the difference between hypogeal and epigeal germination. The environmental factors required for seed germination, identify the chemicals that promote seed germination. Factors that influence imbibition. Seed Dormancy. Seed technology and quality manipulation (cleaning, scarification, sizing, and coating). Storage, aging

effects. Artificial seed and Seed improvement techniques (Priming, pelting). Relationship of Seed Maturation to Seed Germination and Vigor.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Power point presentations. Student contact electronically.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory and field work	26
Homework: Organizing and presenting a plant collection (herbarium)	15
Autonomous study	58
Course total	**125**

STUDENT PERFORMANCE EVALUATION	● Final written exams (70%) ● Written work, Public Presentation (15%) ● Written project (15%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Seed Physiology, Ecology and Technology, 2009. Khah, E. M., Publication: University of Thessaly, Volos, (Lecture notes in Greek).
- Principles of Seed Science and Technology, 2001. Copeland, L. O. And McDonald, M. B., Kluwer academic publishers, USA.
- Seeds Handbook, Biology, Production, Processing and Storage1997. Desai, B.B., Kotecha, P.M. and D.K. Salunkhe., Marcel Dekker, Inc.
- Advances in Seed Science and Technology Volume 1, 2006. Vanangamudi, et al,. Publisher: Agrobios (India).
- Σποροπαραγωγή, 2005, Ευθυμιάδης Π., Εκδοτικό Οίκος Αδελφών Κυριαχίδη α.ε
- Agricultural Seed Production, 2011, George, R. A.T., CABI Publication CAB. ISBN: 978-1-84593-819-2.
- Seed Production, Principles and Practices, 1997. Mc Donald, M and Copeland, L, Chapman & hall. New York.

8th Semester (Fall)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Despoina Petoumenou, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES			
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT			
LEVEL OF STUDIES	UNDERGRADUATE			
COURSE CODE	BK1043	**SEMESTER**	8th (SPRING)	
COURSE TITLE	GENERAL VITICULTURE			
INDEPENDENT TEACHING ACTIVITIES			**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises			4	5
COURSE TYPE	Specialised general knowledge and skills development			
PREREQUISITE COURSES:	-			
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek			
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)			
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_192/			

2. LEARNING OUTCOMES

Learning outcomes

The course is an introductory course to the science of grapevine cultivation. The course material is destined to introduce the students to the basic understanding of main functions of grapevine and its morphology and physiology, as well as the basic viticultural practices used in a commercial vineyard.

The course material is destined to introduce the student to the methodology used for the establishment and management of a modern and commercial vineyard. Furthermore, the scope of this course is the development of knowledge concerning the training systems, vegetative and reproductive cycle of the grapevine.

With the completion of course requirements the student is able to:

A. Understand the morphology, anatomy and function of the various organs of the grapevine and their use in the commercial Viticulture.
B. Understand of the annual vegetative cycle, the phenological stages and the physiological base of these. This knowledge will be critically used to achieve specific targets to produce the desirable quantitative e qualitative viticultural products.
C. Understand the establishment of a commercial vineyard and the factors that affecting it.
D. Understand the importance of pruning and its better practical application.
E. Study and discriminate the critical points needing improvements in a commercial vineyard or study the establishment and guide the developers for a new vineyard establishment to successful results.
F. Is in position to understand and evaluate the negative consequences from a biotic or abiotic factor to the crop and is able to find preventive or curative methods to avoid or minimize negative consequences.
G. Has the capacity to explore, evaluate and use new knowledge from literature sources outside the ones used in the course.
H. Has the basic communication skills to interact with his/her co-students, instructor and various stakeholders in grapevine cultivation matters.

I. Is in position to attend relevant courses at the postgraduate study programs.
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Decision-making Working independently Team work Project planning and management Respect for the natural environment Production of free, creative and inductive thinking

3. SYLLABUS

i. Introduction, Botanical origin, Geographical distribution and current situation of Viticulture in Greece and world-wide, Productive grapevine cultivars, Grape-derived products, Current trends and prospects of Greek vineyard.
ii. Morphology and Anatomy of Grapevine organs: Root system, Trunk and Arms (Cordons), Canes, Shoots, Buds, Leaf, Tendrils, Inflorescence, Flower, Cluster, Berry, Seed.
iii. Annual and Reproductive Cycle of the Grapevine: Bleeding, Bud break, Shoot growth, Wood maturity, Leaf fall, Winter lethargy period, Stages of Flower and Berry development, Flowering, Pollination, Fertilization, Fruit set, Berry development.
iv. Establishment of commercial vineyard: Climate(Meteorological data and Geographical climate factors), Bioclimatic indices, Climate change and Viticulture, Soil, Selection of Grapevine variety and Rootstock, Vineyard design, Trellis posts and Post materials, Planting.
v. Grapevine Pruning: Basic physiological principles of pruning, Pruning and Training systems, Reasons and Selection criteria of Pruning Grapevines, Cane and Spur pruning, Trellis system and Winter pruning of the Greek vineyard.
vi. Cultivation practices: Pruning, Objectives of pruning, Green pruning (Sucker removal-Topping-Defoliation, Girdling, Thinning), Soil Management, Fertilization, Irrigation, Harvest.

Practice: The lessons are supported by training time in the vineyard and in the lab.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	The lessons are supported by pc slides, videos and by discussion on the different topics
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory and field exercises on experimental vineyard of the University	13
Educational visits to commercial vineyards	13
Autonomous study	73
Course total	**125**

STUDENT PERFORMANCE EVALUATION	1. Lectures final oral/written exams (50%) 2. Laboratory final oral/written exams, case study oral and written presentation (50%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. N. Nikolaou, 2020. Viticulture (3rd Edition), Sigxroni Paideia Publ., Thessaliniki.
2. M.N. Stavrakakis, 2013. Viticulture, Tropi Publ., Athens.

3. Keller M., 2015. The Science of Grapevines – Anatomy and Physiology. Second Edition. Elsevier: Academic Press, Burlington, MA, USA.
4. Galet P., 2000. General viticulture (J. Smith Trans.), Oenoplurimedia, Chaintré, France.
5. Winkler et al., 1995. General Viticulture, University of California Press
6. Di Michael G. Mullins, Alain Bouquet, Larry E. Williams, 1992. Biology of the Grapevine, Cambridge University Press.
7. R. Smart and M. Robinson, 1991. Sunlight into Wine: A Handbook for Winegrape Canopy Management, Winetitles, Adelaide, Australia.

- Related academic journals:

American Journal of Enology and Viticulture
Australian Journal of Grape and Wine Research
Vitis
Functional Plant Biology
Acta Horticulturae
HortScience
Scientia Horticulturae

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Georgios Nanos, Professor; Persefoni Maletsika, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1010	**SEMESTER**	8th (SPRING)
COURSE TITLE	SPECIFIC POMOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Specialised general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_150/		

2. LEARNING OUTCOMES

Learning outcomes

The course is the continuation of the Pomology I course studying various cultivated fruit species. The course material is destined to deepen the knowledge of the students to the cultivation of fruit trees and shrubs able to be cultivated in the various Greek microclimates and have economic importance for the country. Emphasis is given to the available genetic material, the physiology of each species, its interrelationship with the environment, the required cultural practices for each crop and postharvest handling of its fruit.

The course also refers to basic knowledge on sustainable use of inputs, certification of fruit production, environmentally-friendly plant production (including organic fruit production), evaluation of cultural practices on tree performance, fruit quality, humans and environment, so that the student will complete his/her understanding about management of some major and minor tree fruit species in Greece. The course uses knowledge from various specialized courses related to plant production to practically apply them to fruit science.

Finally, the scope of the course is the development of global knowledge for tree functioning and the necessary sustainable practices to be applied to sustainable, environmentally-friendly fruit production.

With the completion of course requirements the student is able to:

- Has the basic knowledge of the tools and techniques to sustainable cultivation of various fruit trees cultivated or able to be cultivated in Greece
- Has the capacity to explore, evaluate and use new knowledge from literature sources outside the ones used in the course
- Is able to study and discriminate the critical points needing improvements in an fruit tree company or study the establishment and guide the developers for a new tree fruit establishment to successful results
- Is in position to understand and evaluate the negative consequences from a biotic or abiotic factor to the crop and is able to find preventive or curative methods to avoid or minimize negative consequences

● Has the basic communication skills to interact with his/her co-students, instructor and various stakeholders in fruit tree cultivation matters.
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Decision-making Working independently Team work Working in an interdisciplinary environment Project planning and management Respect for the natural environment Production of new research ideas

3. SYLLABUS

Introduction to environmentally-friendly cultivation methods: integrated production, precision pomology, organic and climate-neutra production and certification of the methods Integrated almond production: cultivars-rootstocks, ecology, pruning-training, cultural techniques, harvest, postharvest handling Integrated walnut production: cultivars-rootstocks, ecology, pruning-training, cultural techniques, harvest, postharvest handling Integrated pistachio production: cultivars-rootstocks, ecology, pruning-training, cultural techniques, harvest Integrated chestnut production: cultivars-rootstocks, ecology, pruning-training, cultural techniques, harvest, postharvest handling Integrated kiwifruit production: cultivars-rootstocks, ecology, pruning-training, cultural techniques, harvest, postharvest handling Soft fruit cultivation: strawberry, raspberry, blackberry, blueberry, Ippophaes, Goju berry Integrated citrus production: importance, genetic material, physiology and climatic requirements, propagation, cultural techniques, postharvest handling Basic cultivation knowledge of avocado, prickly pear, pomegranate, loquat and persimmon Basic cultivation knowledge of tropical fruit trees (banana, mango, pineapple, papaya).

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of powerpoint presentations in lectures, use of internet and electronic and hard-copy library resources for solving real-life problems
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Class teaching</td><td>26</td></tr><tr><td>Laboratory exercises</td><td>14</td></tr><tr><td>Field trips</td><td>8</td></tr><tr><td>Field exercises to Experimental Farm</td><td>12</td></tr><tr><td>Case study</td><td>15</td></tr><tr><td>Autonomous study</td><td>50</td></tr><tr><td>Course total</td><td>125</td></tr></table>
STUDENT PERFORMANCE EVALUATION	Written examinations (70% to the final grade), oral examinations (10%), case study oral and written presentation (10%), participation and final exam to laboratory material (10%)

	The written exams consist of short answers to descriptive and real-life problem solving questions based on study material given as book and notes by the instructor and additional material available in the laboratory of Pomology and the departmental library.

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. D. Vasilakakis, General and Specific Pomology, Gartaganis Publ., Thessaloniki, 2004, p. 755.
2. M.D. Vasilakakis and J.N. Therios, Specific Pomology – Citrus, Gartaganis Publ., Thessaloniki, 2006, p. 295.
3. K.A. Pontikis, Citrus Cultivation, Stamoulis Publ., Athens, 1993, p. 328.
4. Instructor's notes on recent advances for the course subjects

- Related academic journals:

HortScience, HortTechnology, Scientia Horticulturae, Acta Horticulturae, Fruits, European J. Horticultural Science.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Christos Athanassiou, Professor; Dr. Konstantinos Zarpas (Laboratory Teaching Staff)

1. ΓΕΝΙΚΑ

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	HΦ0803	**SEMESTER**	8th (SPRING)
COURSE TITLE	APPLIED ENTOMOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Scientific area		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/modules/contact/index.php?course_id=4015		

2. LEARNING OUTCOMES

Learning outcomes

This course aims in introducing in applied- economic entomology, with emphasis in pests of cultivated plants (orchards, arable crops, horticulture, and urban plant species).

In this course, the students will be familiarized with subjects related with the phenology, biology ethology and management of insect pests in crops. For this purpose, pest species will be presented per type of crop (i.e. cereals, legumes etc.), and are classified according to their importance. In addition, the priorities in pest management practices and strategies is analyzed, at the crop level and under the basis of area-wide management. Moreover, emphasis is given in integrated and biological control, as well as in the major action plans, decision support systems and crop protection protocols. Similarly, under the framework if the laboratory exercises of this course, the students are familiarized with the major morphologic characteristics of the species that are to be examined, as well as the symptoms that lead to the accurate diagnosis of the infestation.

With the successful completion of this course, the students will:

- Have the basic knowledge of identification of a wide range of major pest species in crop protection, as well as the identification of the symptoms that are related with infestations by each pest.
- Build the capacity of assessing and utilizing the available methods of integrated and biological control.
- Evaluate the design and deployment of pest management programs, at the farm and at the area-wide scale.

General Competences

Synthesis of available information, with the use of required technologies.
Identification, management and decision-making for insect control.

3. SYLLABUS

- Insects of Pome fruit
- Insects of Stone fruit
- Insects of Citrus
- Insects of Olives
- Insects of other cultivated tree species

- Insects of legumes
- Insects of industrial crops-1
- Insects of industrial crops-2
- Insects of potato, vegetables
- Polyphagous insects
- Insects in protected crops
- Insects of urban green areas

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Computer-based presentations in classes. Assisted teaching by using library material.
TEACHING METHODS	

Activity	Semester workload
Classes	26
Laboratory exercises	26
Study	73
Course Total	**125**

STUDENT PERFORMANCE EVALUATION	For the theoretical and the laboratory part: Written final exams (100 %), that includes short questions and laboratory specimens, respectively.

5. ATTACHED BIBLIOGRAPHY

-Suggested bibliography:

1. Presentations and additional material (available also in English)

COURSE OUTLINE

COURSE COORDINATOR/INSTRUCTORS: Ioannis Vagelas, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	HΦ0804	**SEMESTER**	8th (SPRING)
COURSE TITLE	SPECIALISED SPECIFIC TOPICS IN PLANT PATHOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		4	5
COURSE TYPE	Background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_151/		

2. LEARNING OUTCOMES

Learning outcomes
Upon successful completion of this course, students will be able to: • recognize symptoms and signs and identify the cause of the most important diseases of cultivated trees and grapevines in Greece advise farmers regarding the methods and proctices for control of these diseases in sustainable agriculture
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Make decisions Team work Work autonomously Respect natural environment Advance free, creative and causative thinking

3. SYLLABUS

Basic information on host range, symptomatology, etiology, pathogenesis, diagnosis and control of the most important diseases of cultivated trees (pome, stone, citrus, olive, pistachio) and grapevines caused by fungi, prokaryotes, viruses and environmental factors. Exercises in diagnosis, isolation and identification of causal disease agents. Preparation of a herbarium with diseased plant material and visits in orchards with phytopathological problems.

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>MODES OF DELVERY</td><td>Class attendance</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Power point presentations. Student contact electronically.</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>Laboratory exercises</td><td>26</td></tr>
<tr><td>Student independent work</td><td>73</td></tr>
<tr><td>Course total</td><td>125</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>

Lectures final written exams (50%)
Laboratory final written exams (50%)

</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Agrios, G.N. (2004). "Plant Pathology". 5th Edition. Academic Press, Inc., San Diego, California.
2. Panagopoulos, C.G. (2000). "Diseases of Fruit Trees and Vines". Publisher: Stamoulis, Athens, Greece. (In greek).

- Related academic journals:

Plant Pathology, Plant Disease, European Plant Pathology, Phytopathology, Molecular Plant Pathology.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Ourania Pavli, Associate Professor; Evangelia Panagiotaki (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1026	**SEMESTER**	8th (SPRING)
COURSE TITLE	SPECIAL PLANT BREEDING AND SEED PRODUCTION OF AGRICULTURAL AND HORTICULTURAL CROPS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_147/		

2. LEARNING OUTCOMES

Learning outcomes
An introduction to the basic knowledge of seed production and plant propagation in vegetable and field crops. An expanded coverage of fundamental and practical aspects of quantities and qualitative seed production with more emphasis is given based on current day need.
General Competences
● Search for, analysis and data and information, with the use of the necessary technology ● Team work ● Project planning and management ● Production of free, creative and inductive thinking.

3. SYLLABUS

Describe the practical and technical aspects of seed production of major agricultural and vegetable plant species. Describe the structure of the Seed industry, organization involved, planning for seed production, identification of regions for seed production, characteristics and importance of quality seed, seed villages, release of new varieties, stages of multiplication, inputs, production targets, maintenance of breeder seed in self and cross pollinated crops and reproduction in agricultural crops. Producing of hybrid or cultivars seed's of vegetable and field crops. Sexual or Asexual crop propagations. Seed Production: Principles and Production Within and Outside Area of Adaptation. Vegetable grafting techniques propagations. Effect of environment during seed development on seed viability, vigour and quality. Harvesting and Post harvesting changes in seed quality and its performance. Seed Legislation and Law Enforcement. Development and Release of Public and Private Varieties

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>MODES OF DELIVERY</td><td>Class attendance</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Power point presentations. Student contact electronically.</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>Laboratory and field work</td><td>26</td></tr>
<tr><td>Homework: Organizing and presenting a plant collection (herbarium)</td><td>5</td></tr>
<tr><td>Autonomous study</td><td>68</td></tr>
<tr><td>Course total</td><td>125</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>● Final written exams (70%)
● Written work, Public Presentation (15%)
● Written project (15%)</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Seed Production of major agricultural crops, 2009. Khah, E. M., Publication: University of Thessaly, Volos, (Lecture notes in Greek).
2. Seed Production, principles and practices 1997. McDonald, M. B. and L. O. Copeland, Chapman & Hall, USA.
3. Hybridization of crop Plants, 1980. Fehr, W.R. and H. Hadley, ASA and CSSA, Publishers,USA.
4. Seed Production of World Crops, 2001. Kelly, A. F. and R. A. T. George, Jone Willy & Sons.
5. Vegetable Seed Production, 1999. George, R. A.T., CABI Publication, (ISBN 0-85199-336-2)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nicholaos Danalatos, Professor; Dr. Elpiniki Skoufogianni (Laboratory Teaching Staff); Dr. Dimitrios Bartzialis (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	HΦ0801	**SEMESTER**	8th (SPRING)
COURSE TITLE	Filed Crops II		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	5 ECTS
COURSE TYPE	Background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_149/		

2. LEARNING OUTCOMES

Learning outcomes
This course examines the factors affecting the productivity of a number of extensively grown crops and the management associated for yield optimization of the particular crop. Upon successful completion of this course the student will be able to be aware of: • the taxonomy and basic morphological features of plants. • the ecological, cultural, nutritional and plant protection needs. • the uses and their products , and their economic importance .
General Competences
● Search for, analysis and synthesis of data and information, with the use of the necessary technology ● Working independently ● Team work ● Project planning and management ● Respect for the natural environment ● Production of free, creative and inductive thinking

3. SYLLABUS

This course is concerned with three (3) plant groups: Crops for fiber production (Gossypium hirsutum L., Linum usitatissimum L., Cannabis sativa L.). Annual crops for oil production (Helianthus annuus L., Sesamum indicum L., Carthamus tinctorius L., Brassica napus L., Ricinus communis L.). Other industrial crops (Beta vulgaris L., Nicotiana tabacum L.) General information (origin, evolution, economic significance, etc), botanic characteristics (morphology, growth and development, classification,

description, etc), varieties, crop ecology (climatic conditions, soil requirements, etc), crop management (crop rotation, sowing, cultivation, fertilization, irrigation, harvesting)

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Power point presentations. Student contact electronically.
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory and field work	26
Homework: Organizing and presenting a plant collection (herbarium)	26
Autonomous study	47
Course total	**125**

STUDENT PERFORMANCE EVALUATION	Final written exams (60%) Laboratory exams (40%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Papakosta - Tasopoulou Despina . 2013. Industrial Plants . Publications Modern Education.
2. Galanopoulou - Sendouka Stella . 2002. Industrial Plants - Cotton and other fiber plants, Oil planrs - Sugar beet - Tobacco. Stamoulis Publications..
3. Papakosta - Tasopoulou Despina . 2002. Industrial Plants. Sugar beet , cotton, tobacco. Publications Modern Education.
4. eclass page https://eclass.uth.gr/courses/AGR_U_149/

- Related academic journals:

Agronomy Journal, European Agronomy Journal, Crop Science, International Journal of Agronomy, Journal of Agronomy and Crop Science.

9th Semester (Fall)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: I. Vagelas, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	BK1045	**SEMESTER**	9th (FALL)
COURSE TITLE	DISEASES OF ORNAMENTAL PLANTS AND FIELD CROPS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		4	4
COURSE TYPE	Specialized training		
PREREQUISITE COURSES:	General Plant Pathology		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_122/		

2. LEARNING OUTCOMES

Learning outcomes
Upon successful completion of this course, students will be able to: ● recognize symptoms and signs and identify the cause of the most important diseases of ornamentals and field crops in Greece. ● advise farmers regarding the methods and practices for control of these diseases in sustainable agriculture.
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Make decisions Work autonomously Respect natural environment Advance free, creative and causative thinking

3. SYLLABUS

Diseases of the ornamentals (rose, carnation, bulbs, tropical and sub-tropical plants) and field crops (cereals, cotton, tobacco, potato, sugarbeet and legumes), caused by fungi, prokaryotes, viruses and environmental factors.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Powerpoint presentations. Communication with ICT.

TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory excercises	26
Assignment	26
Independent work	22
Course total	**100**

STUDENT PERFORMANCE EVALUATION	1. Lectures final written/oral exams (80%). 2. Assignment (20%). 3. Laboratory exercises evaluation (pass-fail)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Panagopoulos, C.G. (1995). "Diseases of Vegetables". Publisher: Stamoulis, Athens, Greece. (In greek).
2. Panagopoulos, C.G. (2003). "Diseases of Ornamental Plants". Publisher: Stamoulis, Athens, Greece. (In greek).
3. Thanasoulopoulos, C. (1996). "Fungal Diseases of Field Crops". Publisher: Ziti, Thessaloniki, Greece. (In greek)
4. Katis, N.& Avgelis, A. (1997). "Virus Diseases of Field Crops". Publisher: Agrotypos, Athens, Greece. (In greek).
5. Koike, S.T., Gladders, P. & Paulus, A.O. (2007). "Vegetable Diseases. A color handbook".The American Phytopathological Society, St Paul, Minnesota.: Stamoulis, Athens, Greece. (In greek).
6. Bennett, W.F. (1993). “Nutrient Deficiencies and Toxicities in Crop Plants”. The American Phytopathological Society, St Paul, Minnesota.
7. http://eclass.uth.gr/eclass/courses/SGEA103/

- Related academic journals:

Plant Pathology, Plant Disease, European Plant Pathology, Phytopathology, Molecular Plant Pathology.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Christos Athanassiou, Professor; George Nanos, Professor; Dr. Konstantinos Zarpas (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΦΖ0902	**SEMESTER**	9th (FALL)
COURSE TITLE	STORED PRODUCT PROTECTION		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Capacity Development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_201/		

2. LEARNING OUTCOMES

Learning outcomes

The basic aim of Stored Product Protection is to introduce students to the management of stored agricultural products and foodstuffs, during their post-harvest treatments and also during their storage and processing treatments, including their protection from infestations and actions related with quality assurance.

In this regard, the students will be familiar with the post-harvest treatments of agricultural commodities, in order to ensure the high standards of qualitative and other desirable characteristics. Moreover, in Stored Product Protection, the insects and the related pests (rodents, mites) are also presented and analyzed, including the measures that should be taken for their control, emphasizing in non-chemical treatments.

After the successful completion of the classes the student will be able to:

- Obtain the basic knowledge of the identification of insects that are related with stored products and processed commodities, as well as for other pest categories (rodents etc.).
- Has the capacity of exploring, evaluating and deploying methods of control, emphasizing in integrated and biological control.
- Be in a position to design, suggest and operate control programs, adopted to the needs of each commodity and each facility.
- Understand the basic characteristics of stored and processed plant products.
- Understand the management chain at the post-harvest stages of plant products from harvest to the consumer.

General Competences

Assessment, analysis and synthesis of data and information available regarding the use of technology of stored product protection.
Identification, management and decision-making in treatments related to post-harvest stages of plant-based products.

3. SYLLABUS

- General principles in stored product protection
- Stored product insects-1
- Stored product insects-2

- Stored product insects-3, other pests
- Stored product pest control 1
- Stored Product pest control-2
- Hazards and risks for public health from the presence of pests in stored products and food
- Dietetic value of plant-based and animal-based food
- Quality characteristics of cereals, legumes, dried fruit and nuts- Requirements of storage facilities in temperature- moisture of the commodity- relative humidity
- Quality characteristics of fresh fruits and vegetables
- Post-harvest chain: harvest, packaging, storage, transport, trade, distribution chains

1. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	In the class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of PowerPoint presentations Support through e-class and other sources of the University (library etc.)
TEACHING METHODS	

Activity	Semester workload
Classes	26
Laboratory exercise	26
Visit for training	4
Homework	14
Study	30
Total (25 hours per credit)	**100**

STUDENT PERFORMANCE EVALUATION .	I. For the theoretical part: Written final exams (80%) that include short questions II. Laboratory exercise exams (10%) III. Homework and presentation (10%)

4. ATTACHED BIBLIOGRAPHY

-Suggested Bibliography :

1. PowerPoint Presentations (available online)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: COURCE COORDINATOR/INSTRUCTORS: Persefoni Maletsika, Assistant Professor; George Nanos, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1037	**SEMESTER**	9th (FALL)
COURSE TITLE	ORGANIC AND INNOVATIVE CROP PRODUCTION METHODS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_114/		

2. LEARNING OUTCOMES

Learning outcomes

The course is skill development on the environmentally-friendly plant cultivation methods and the certification of plant production with national and international quality standards.

The course material focuses on the organic cultivation methods per species group and cultural technique. Includes from the production of certified organic plant propagation material to the production and management of organic products. Special attention is given to plant protection and nutrition methods and material available to Greek organic agriculture.

The second part of the course offers detailed knowledge on integrated production and all environmentally-friendly production and certification methods.

Extended attention is given to basic knowledge on soil health and functions, organic fertilizers, organic plant protection methods and action, alternative cultivation methods, product production and postharvest handling.

Finally, the scope of the course is the complete knowledge for application of organic agriculture and the other certifiable crop production methods for the production of certified environmentally-friendly plant products.

With the completion of the course, the course has:

- The basic knowledge of methods and techniques and the legal requirements – production methods for the sustainable plant production
- Has the capacity to search, evaluate and use new knowledge from literature besides the one given in the course material
- Is capable to study and discriminate the critical points to be improved in an agricultural operation or complete a study for the set up of a new operation and guide the stakeholders to its development
- Has the basic communication skills with the co-students, professor and possible stakeholders for environmentally-friendly crop management matters.

General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Decision-making Working independently Team work Project planning and management Respect for the natural environment Production of new research ideas Production of free, creative and inductive thinking

3. SYLLABUS

Historical review of organic crop production and integrated crop protection and management
Production of organic and certified propagation material
The soil in organic cultivation and organic nutrition management, soil health and functioning
Plant protection products and methods in organic crop management
Postharvest handling (storage, wholesale, retail) of organic products
Integrated crop production management: guidelines, legal requirements, structure, application
Precision agriculture: variable rate application
Energy, carbon, water footprint, climate-neutral products
Life cycle assessment

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of power point presentations in lectures, use of internet and electronic and hard-copy library resources for solving real-life problems
TEACHING METHODS	

Activity	Semester workload
Class teaching	26
Laboratory exercises	26
Field trips	8
Field exercises to Experimental Farm	10
Case study	10
Autonomous study	**20**
Course total	**100**

STUDENT PERFORMANCE EVALUATION .	Written examinations (80% to the final grade), case study oral and written presentation (10%), participation and final exam to laboratory material (10%) The written exams consist of short answers to descriptive and real-life problem solving questions based on study material given as book and notes by the instructor and additional material available in the participating departmental laboratories and library.

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Sfakiotakis, 2000, Integrated Crop Production, AUTH, Agriculture, p. 202
2. K. Tzavella-Klonari, 2000, Integrated Plant Protection, AUTH, Agriculture, p. 155
3. DHO, 1994, Organic Olive Cultivation, p. 269
4. A. Alkimos, 1990. Organic Crops, Psihalos Publ., Athens, p. 128

5. G.W. Ware, 1996, Complete Guide to Pest Control, 3rd Ed., Thomson Publ., p. 388
6. Anonymous, 1992, Beyond Pesticides – Biological approaches to pest management in California, U.C. D.A.N.R. Publ. 21512, p. 183
7. Instructors' notes on recent advances for the course subjects

- Related academic journals:

Crop Science, HortScience, HortTechnology, Scientia Horticulturae, Acta Horticulturae, Fruits, European J. Horticultural Science

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Y. Stamboulis, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΕΠΕΑΕΚ1	**SEMESTER**	9th (FALL)
COURSE TITLE	INTRODUCTION TO ENTREPRENEURSHIP		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4
COURSE TYPE	Special background, Specialised general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	http://entrepreneurship.moke.uth.gr/		

2. LEARNING OUTCOMES

Learning outcomes
The objective of this course is for the students to familiarize themselves with the reality of modern enterprises (particularly the Small to medium-sized and Family Enterprises) and the modern tools of management and to acquire basic entrepreneurial knowledge and culture. It is stressed that entrepreneurship does not only concern the private sector, but also the public sector and non-profit organisations (museums, hospitals, athletic organizations, local authorities etc). The understanding of enterprising activity contributes also to the improvement of effectiveness of those that later will become policy makers for the economy or will work in institutions that provide infrastructures or services to enterprises.
General Competences
● Search for, analysis and synthesis of data and information, with the use of the necessary technology ● Decision-making ● Team work ● Working in an interdisciplinary environment ● Production of free, creative and inductive thinking

3. SYLLABUS

The course, indicatively, will focus on questions that concern: What is an enterprise, foundation and organisation of an enterprise, obligations of the enterprise, financing and economic management, succession, introduction to accounting, co-operatives and their problems, introduction to marketing, distribution, sales, pricing, product and service development, human resources management (hiring, training, wage, losses).

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>MODES OF DELIVERY</td><td>Face to face (in the classroom) and team meetings</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Support through the course website, electronic management tools</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>Laboratory practice / coaching</td><td>26</td></tr>
<tr><td>Team project / business idea</td><td>26</td></tr>
<tr><td>Study and analysis of bibliography</td><td>22</td></tr>
<tr><td>Course total</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>I. Team project (business idea plan): 60%
II. Project presentation: 40%</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Deakins D., Freel M. (2009), Entrepreneurship and Small Firms 5th ed., McGraw-Hill Higher Education
2. Osterwalder A., Pingeur Y. (2010) Business Model Generation, John Wiley and Sons

- Related academic journals:

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Christos Lykas, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1046	**SEMESTER**	9th (FALL)
COURSE TITLE	FLORICULTURE II		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Special background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes in English		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_182/		

2. LEARNING OUTCOMES

Learning outcomes

This course introduces students to the theory and practice of ecology and management of plants used to design sustainable urban green space. Analyze problems of urban and suburban landscape and provide examples to overcome these problems with the selection of plants with particular characteristics. Another key focus is the role of green space in improving the ecological function of urban areas.

After completing the course students:

- will have learned both basic and specific features of plants used in landscaping
- will have learned both basic and specific features of urban green space ecology
- will be able to identify landscape plants on the properties they have to manage
- will be able to select the right plant for the right site and the right purpose
- will have learned management methods of urban and suburban green space

General Competences

Decision-making
Adapting to new situations
Working independently
Team work
Search for, analysis and synthesis of data and information, with the use of the necessary technology
Working in an international environment
Project planning and management
Respect for the natural environment

3. SYLLABUS

- Gardening plants features and properties (description of the most important species, soil and climate requirements, basic characteristics and properties).
- Use of ornamental plants for planning urban and suburban green space.

- Lawn grass and turf grass management.
- The constructed landscape environment: typical modifications that impact plant performance
- Principles for planning urban and suburban areas.
- Green networks.
- Typical challenges to landscape plant performance: diseases, pests, etc
- Landscape Management.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Lectures in class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	E-class facilities Plant data base Landscape design software
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice	26
Fieldwork	25
Software learning and practicing	8
Projects	15
Course total	**100**

STUDENT PERFORMANCE EVALUATION	Language of evaluation : Greek Final exams performed dy: Project development and analysis (80%) Project presentation (20%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1. Chrisothemis Georgakopoulou –Vogiatzi, Landscape ornamental plants, Gartaganis Pab. Thessaloniki 2008, pp. 439.
2. Giannis Patlis. Gardening plants, Stamoulis Pab. Athens 2008, pp. 740.
3. Ioannis A. Tsalikidis & Eleni A. Athanasiadou, Sustainable landscape design Gartaganis Pab. Thessaloniki 2009, pp 141.
4. Marco Amati, Urban Green Belts in the Twenty-first Century, Ashgate Publishing Ltd, σελ. 268
5. David B. Lindenmayer and Richard J. Hobbs, Managing and Designing Landscapes for Conservation: Moving from Perspectives to Principles, Blackwell Pablishing Ltd 2007, σελ. 587.
6. Nikos Mpelavilas & Fereniki Vatavali, Green and open urban space, WWF Hellas/Athens 2009, pp. 119.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nikolaos Katsoulas, Professor; Dr. Evaggelini Kitta (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1013	**Semester**	9th (FALL)
COURSE TITLE	EQUIPMENT AND TECHNOLOGIES FOR POSTHARVEST TREATMENT OF AGRICULTURAL PRODUCTS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Specialized general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_144/		

2. LEARNING OUTCOMES

Learning outcomes

The course is a tool to introduce students to the design concepts of post-harvest handling facilities for agricultural products.

This course aims to introduce students to the basic concepts of energy and mass exchanges in agricultural products and their storage facilities. Particular emphasis is given to the methodology for calculation of needs for ventilation, heating, cooling and drying of agricultural products and in the calculation of the necessary capacity of the respective systems for climate control in storage facilities. Also reference is done to the operation and control of air conditioning systems in agricultural products storage and postharvest treatment facilities.

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

• Understand the basic and critical features of air conditioning systems used in installations for postharvest handling of agricultural products.

• Analyze the design of a storage or postharvest treatment room for agricultural products.

• Prepare design studies for silo, cold storage or drying facilities for agricultural rpoducts.

General Competences

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Working independently
- Team work

3. SYLLABUS

1.	Introduction to the concept of Storage. Existing facilities and types of warehouses.

2. Storage of fresh fruits and vegetables. Types and characteristics of storage facilities and their environmental control.
3. Construction of storage facilities for agricultural products. Potato storage.
4. Energy losses in storage buildings. Building insulation calculation.
5. Calculation of temperature and moisture on the surfaces and the interior walls of buildings.
6. Ventilation of storage rooms. Dimensioning of ventilation system.
7. Drying stored products.
8. Driers for fresh fruit.
9. Pre-cooling. Pre-cooling process. Calculation of cooling loads during precooling.
10. Cooling. Cooling process for fresh agricultural products. Cooling loads for agricultural products cold storage.
11. Design and construction of a conventional cold storage room. Cooling equipment.
12. Maintaining a controlled atmosphere.
13. Mechanical cooling. Automation, refrigeration equipment, temperature control sensors, humidity, CO_2 ethylene and oxygen storage areas for fresh products.
14. Packaging, standardization of agricultural products. Packaging materials and sorting systems and standardization.

4. TEACHING AND LEARNING METHODS - EVALUATION

LECTURES - ORAL PRESENTATIONS	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Support of the learning process through the electronic platform e-class Specialized software for microclimate simulation in storage facilities
TEACHING METHODS	

Activity	Semester workload
Lectures	52
Individual exercises	15
Individual projects	12
Visits in commercial greenhouses	6
Non-directed study	15
Course total	**100**

STUDENT PERFORMANCE EVALUATION .	I. Final written exam (79%) comprising: - Short Answer Questions - Problem solving II. Presentation of individual work (21%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Ακριτίδης Κ. 1993. Ξήρανση – Αποθήκευση Γεωργικών Προϊόντων. Εκδώσεις Γιαχουδη- Γιαπουλη, Θεσσαλονίκη (in Greek).
2. Loewer Otto J. Bridges Thomas C. Bucklin Ray A, 1994. On-farm drying and storage systems / Otto J. Loewer, Thomas C. Bridges, Ray A. Bucklin. ASAE, 560 p
3. Dry grain aeration systems design handbook / MidWest Plan Service. Dry Grain Aeration Systems Design Committee. -1st ed. Ames, Iowa, USA: Midwest Plan Service, 1997, 88 p
4. Κατσούλας Ν., Κίττας Κ., 2008. Εγκαταστάσεις Μετασυλλεκτικών Χειρισμών Αγροτικών Προϊόντων. Διδακτικές Σημειώσεις, Εκδώσεις Πανεπιστημίου Θεσσαλίας (in Greek).

- Related academic journals:

Biosystems Engineering

Transactions of the ASABE Energy and Buildings Applied Energy in Agriculture

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Aris Kyparissis-Sapountzakis, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1038	**SEMESTER**	9th (FALL)
COURSE TITLE	GEOGRAPHICAL INFORMATION SYSTEMS AND REMOTE SENSING		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4
COURSE TYPE	Specialised general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_134/		

2. LEARNING OUTCOMES

Learning outcomes
By the end of this course, the students will: 1. know and be able to describe the principles of using temporal and spatial large-scale information provided by Geographical Information System and Remote Sensing in agriculture. 2. be able to create digital thematic maps and enter spatial and non-spatial information into them. 3. combine knowledge and information for an effective and objective decision making. 4. be familiar with procedures used for in time and accurate diagnostic mapping of crops health and responses to various environmental stress factors. 5. have the capacity to detect, analyse and evaluate remote-sensed crop information for use in precision agriculture.
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Working independently, Team work Working in an interdisciplinary environment Production of new research ideas Respect for the natural environment

3. SYLLABUS

GIS
Basic Concepts and Definitions of the Geographical Information Systems (GIS) Functions of a GIS - Geographic Data, Raster and Vector Models Geographic and Projected Coordinate Reference Systems Cartographic performance of digital geographical data using GIS

Geographical Data analysis using GIS Creation of thematic maps using GIS **Remote Sensing** Remote sensing and plants: principles and applications Electromagnetic radiation and Satellite Remote Sensing Spectral signatures Vegetation Indices and applications in precision agriculture

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	➢ PowerPoint use in lectures ➢ Use of QGIS and SNAP free software ➢ Teaching support by e-learning platform Communication with students with e-mails via e-learning platform
TEACHING METHODS	

Activity	Semester workload
Lectures/interactive teaching	26
Laboratory practice	26
Software learning	15
Non-directed study	33
Course total	**100**

STUDENT PERFORMANCE EVALUATION	Written final examination, including: -multiple choice questionnaires - short-answer questions - problem solving/short-answer questions concerning

5. ATTACHED BIBLIOGRAPHY

-Suggested bibliography:

1) Remote Sensing of the Environment – An Earth Resourse Perspective, Jensen J.R., Publisher: Pearson, 2006 (2nd edition)
2) Remote Sensing and GIS Application for Site Specific Agriculture: Agro-Informatics for Sustainable Agriculture, by F. Iqbal, Publisher: VDM Verlag; 2010.
3) Distributed Hydrologic modeling using GIS by B.E. Vieux, Publisher: Springer Science + Business Media, Inc. , eBook ISBN: 1-4020-2460-6; 2005
4) Open Source GIS A GRASS GIS Approach, by M. Neteler and H. Mitasova, Publisher: Springer Science+Business Media, LLC. , e-ISBN-13: 978-0-387-68574-8; 2008.
5) GIS application in agriculture: by F.J. Pierce, D. Clay, Publisher: CRC Press; 2007.

-Related academic journals:

Remote Sensing of Environment, International Journal of Remote Sensing, European Journal of Remote Sensing, Remote Sensing Letters

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Christos Athanassiou, Professor; Nikolaos Papadopoulos, Professor

1. ΓΕΝΙΚΑ

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1039	**SEMESTER**	9th (FALL)
COURSE TITLE	PESTS OF PUBLIC HEALTH		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Capacity Development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/modules/auth/courses.php?fc=54		

2. LEARNING OUTCOMES

Learning outcomes

The basic aim is the introduction of the students in subjects related with the management practices of pests of public health, emphasizing in insect pests, but also in other organisms, such as mites, rodents etc.

In this regard, the students will become familiar with the basic outlines of morphology, biology, ethology, phenology and management of the target pests, in the urban and suburban environment. Also, the students will be introduced in medical and veterinary entomology and zoology. At the same time, the epidemiology of the diseases that are associated with these pests will be also analyzed. Reference to these pests will be carried out per pest category (see below), by underlying the priorities in pest control methods, in urban areas but also in larger suburban areas (i.e. in the case of mosquitoes). Emphasis is given to integrated and biological control, and also in adjusted protocols for pest control. At the laboratory exercises, the students will be trained in the identification of pests, by using basic morphological and other characters and indicators.

After the completion of this course, the student will be able to:

- identify insects and other animal pests, as well as their symptoms that indicate their presence, for a wide range of pest categories.
- evaluate and utilize methods of control, with specific reference in integrated and biological control.
- design, suggest and operate management protocols and evaluate risk levels from the presence of these pests.
- obtain knowledge for the basic principles of the legislation that is related with the management of these pests.

General Competences

Synthesis of available information, with the use of required technologies
Identification, management and decision-making for insect control.

3. SYLLABUS

- Introduction to pests of public health

- Blood sucking Diptera-1
- Blook sucking Diptera-2
- Other blood sucking insects (flees, bedbugs, lice etc.).
- Non blood-sucking insects of public health (cockroaches etc.).
- Mites
- Other arthropods (stinging Hymenoptera, spiders etc.).
- Rodents- Other vertebrates (birds, etc.)
- Diseases that are related with pests of public health-1
- Diseases that are related with pests of public health-2
- Epidemiology of pests of public health
- Management of pests of public health
- Legislation- Biocides

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Computer-based presentations in classes. Assisted teaching by using library material.
TEACHING METHODS	

Activity	Semester Workload
Classes	26
Laboratory exercises	26
Study	48
Course Total	**100**

STUDENT PERFORMANCE EVALUATION	For the theoretical and the laboratory part: Written final exams (100 %), that includes short questions and laboratory specimens, respectively.

5. ATTACHED BIBLIOGRAPHY

-Suggested Bibliography:

2. Presentations and additional material (available also in English)
3. Mallis A. 2014. Handbook of Pest Control. 10th Edition, PCT.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Despoina Petoumenou, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1042	**SEMESTER**	9th (FALL)
COURSE TITLE	SPECIFIC VITICULTURE		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Specialised general knowledge and skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_166/		

2. LEARNING OUTCOMES

Learning outcomes

The purpose of this course is to introduce students to the reproduction and grapevine propagation, to the Ampelography and the production of grape-derived quality products. This course aims to introduce the students to the methodology used either on grapevine propagation or, the viticultural techniques and the identification of grapevine cultivars and rootstocks and their properties and cultivation behavior of these, for the proper management of a modern commercial vineyard.

Finally, the scope of the course is the acquisition of specialized knowledge for the production of the main grape-derived quality products such as table grapes, raisins, wine, ecc.

With the completion of the course, the student has:

J. Understand the properties and the selection criteria, properties, quality characters and the growing behavior of cultivated grapevine cultivars.
K. Understand the asexual grapevine propagation by cutting and grafting.
L. Understand the cultivation methods for the production of the main grape-derived quality products.
M. Understand the quality characteristics of table grape varieties, grape varieties for wine making, raisin grape varieties, etc.,
N. Has the capacity to explore, evaluate and use new knowledge from literature sources outside the ones used in the course.
O. Is able to study and discriminate the critical points needing improvements in a commercial vineyard and/or winery or develop a study for the establishment of a new vineyard or winery and guide the developers to successful results.
P. Is in position to understand and evaluate the negative consequences from a biotic or abiotic factor to the crop and is able to find preventive or curative methods to avoid or minimize negative consequences.
Q. Has the basic communication skills to interact with his/her co-students, instructor and various stakeholders in plant propagation matters.
R. Is in position to attend relevant courses at the postgraduate study programs.

General Competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Decision-making

Working independently Team work Working in an interdisciplinary environment Project planning and management Respect for the natural environment Production of new research ideas

3. SYLLABUS

i. Ampelography: Ampelographic description systems, Ampelographic characters of grapevine organs, Ampelographic study, Grapevine rootstocks, Greek grapevine cultivars, Quality characteristics and properties of grapevine cultivars used for winemaking, Table Grape cultivars, Raisin grape cultivars, the most important Greek and foreign grapevine varieties (origin, ampelographic characters, properties and crop behavior).
ii. Propagation of grapevine: Vegetative propagation, Propagation with cuttings, Mother vine rootstocks plantation, Establishment of a mother vine rootstock plantation, Propagation by cuttings, Success conditions of grafting, Grafted Grapevine Nursery, Field grafting.
iii. Table grape production: Quality characteristics and criteria of table grape cultivars, Harvest, Packaging, Precooling, Optimum storage conditions.
iv. Production of raisins: Quality Characters of raisin grape cultivars, Raisin Quality Characteristics, Study of the Drying Process, Production of Sultana raisins, Production of Corinthian currant.
v. Wine production: Global economic geography of wine, Legislative classification of Greek wines, Production of white and red wines, Wine tasting.
vi. Other Grape-derived products.
vii. The obbligations of the trainees include the preparation and the submission of the herbarium (Ampelologio).

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of power point presentations and videos in lectures
TEACHING METHODS	

Activity	Semester workload
Class teaching	26
Laboratory exercises	15
Field trips	13
Field exercises to Experimental Farm	12
Autonomous study	34
Course total	**100**

STUDENT PERFORMANCE EVALUATION	1. Lectures final oral/written exams (50%) 2. Laboratory final oral/written exams, case study oral and written presentation (50%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
D.E. Stavrakas, 2010. Ampelography, Ziti Publ., Peraia Thessalonikis.
M.N. Stavrakakis, 2013. Viticulture, Tropi Publ., Athens.
E. Hr. Soufleros, 2015. Oenology, Science and Expertise, Soufleros Publ.
A. Tsakiris, 2006. Greek wine tasting, Psichalos Publ., Athens.
P. Ribéreau-Gayon, D. Dubourdieu, B. Donèche, A. Lonvaud, 2006. Handbook of Enology, Vol. 1: The Microbiology of Wine and Vinifications, Wiley, 2nd edition.

- Related academic journals:
American Journal of Enology and Viticulture
Australian Journal of Grape and Wine research
Vitis
Journal of the Science of Food and Agriculture
Acta Horticulturae
HortScience
Scientia Horticulturae

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Despoina Petoumenou, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1041	**SEMESTER**	9th (FALL)
COURSE TITLE	OENOLOGY		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4
COURSE TYPE	Specialised general knowledge and skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_166/		

2. LEARNING OUTCOMES

Learning outcomes

The purpose of this course is to introduce students to the reproduction and grapevine propagation, to the Ampelography and the production of grape-derived quality products. This course aims to introduce the students to the methodology used either on grapevine propagation or, the viticultural techniques and the identification of grapevine cultivars and rootstocks and their properties and cultivation behavior of these, for the proper management of a modern commercial vineyard.

Finally, the scope of the course is the acquisition of specialized knowledge for the production of the main grape-derived quality products such as table grapes, raisins, wine, ecc.

With the completion of the course, the student has:

S. Understand the properties and the selection criteria, properties, quality characters and the growing behavior of cultivated grapevine cultivars.
T. Understand the asexual grapevine propagation by cutting and grafting.
U. Understand the cultivation methods for the production of the main grape-derived quality products.
V. Understand the quality characteristics of table grape varieties, grape varieties for wine making, raisin grape varieties, etc.,
W. Has the capacity to explore, evaluate and use new knowledge from literature sources outside the ones used in the course.
X. Is able to study and discriminate the critical points needing improvements in a commercial vineyard and/or winery or develop a study for the establishment of a new vineyard or winery and guide the developers to successful results.
Y. Is in position to understand and evaluate the negative consequences from a biotic or abiotic factor to the crop and is able to find preventive or curative methods to avoid or minimize negative consequences.
Z. Has the basic communication skills to interact with his/her co-students, instructor and various stakeholders in plant propagation matters.
AA. Is in position to attend relevant courses at the postgraduate study programs.

General Competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Decision-making

Working independently Team work Working in an interdisciplinary environment Project planning and management Respect for the natural environment Production of new research ideas

3. SYLLABUS

i.	Wine production: economic geography of wine and wine production around the world.
ii.	The types and categories of wines. Legislative classification of Greek wines.
iii.	Grape as a raw material for winemaking.
iv.	The chemistry of must and wine.
v.	Alcoholic fermentation.
vi.	Vinification methods for the production pf white, red and rose wines.
vii.	Production of flavored, dried, vins de liqueur, naturally sweet, sweet natural, natural sparkling and artificial sparkling wines.
viii.	Alcoholic fermentation and enzymatic actions during vinification.
ix.	Most common wine diseases.
x.	Wine tasting.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of power point presentations and videos in lectures
TEACHING METHODS	**Activity** / **Semester workload** Class teaching: 26 Laboratory exercises: 15 Field trips: 11 Autonomous study: 48 Course total: **100**
STUDENT PERFORMANCE EVALUATION	1. Lectures final oral/written exams (50%) 2. Laboratory final oral/written exams, case study oral and written presentation (50%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Soufleros, E. Hr. 2015. Oenology, Science and Expertise, Thessaloniki.
2. Tsakiris, A. 2006. Greek Wine knowledge, Psichalos Publ., Athens.
3. Ribéreau-Gayon, P., Dubourdieu, D., Donèche, B., Lonvaud, A. 2006. Handbook of Enology, Vol. 1: The Microbiology of Wine and Vinifications, Wiley, 2nd edition.

- Related academic journals:

American Journal of Enology and Viticulture
Australian Journal of Grape and Wine research
International Journal of Wine Research
Journal of the Science of Food and Agriculture
Food Chemistry

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Olga Gortzi, Professor; Evlalia Koufostathi (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTEMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	M0107	**ΕΞΑΜΗΝΟ ΣΠΟΥΔΩΝ**	9th (FALL)
COURSE TITLE	STANDARDISATION – QUALITY CONTROL OF AGRICULTURAL PRODUCTS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Specialised general scientific knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_175/		

2. LEARNING OUTCOMES

Learning outcomes

The course learning outcome is general scientific knowledge in Food Science.

The target of the course is to understand the principals of crop production and the meaning of food standardization and its importance in the global food market.
The students with the successful completion of the course will be able to:

- Uunderstand the major principles of standardization and quality control – Global markets
- Understand the major principals of quality control
- Understand the major principals and methods of preservation.
- Estimate the quality of several agricultural products and foods.

General Competences

- Working independently
- Team work
- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Production of free, creative and inductive thinking
- Project planning and management

3. SYLLABUS

The content of this course is:

- Introduction in the principals of food production.
- Quality of agricultural products and foods Ο.Π.Α.Π, Π.Ο.Π and Π.Γ.Ε.
- Principles of preservation of agricultural products and foods.

- Novel packaging of agricultural products and foods
- Advantages of standardization of agricultural products and foods - Global markets
- Methods and principals of quality control in a wide range of agricultural products and foods/ Stages of quality control

4. **TEACHING AND LEARNING METHODS - EVALUATION**

MODES OF DELIVERY	Face-to-face, in class
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGIES	Use of ICT in teaching, laboratory education, communication with student.
TEACHING METHODS	

Activity	Semester workload
Lectures	*26*
Laboratory practice, in the basic principles of food safety and quality assurance	26
Study and analysis of bibliography-team work (project)	20
Educational visits/ Individual projects	10
Student's study hours	18
Course total	**100**

STUDENT PERFORMANCE EVALUATION	I. Final written exams (multiple choice questionnaires, short-answer questions) or/and II. Team work (project) – presentation and /or III. Laboratory work (optionally).

5. **ATTACHED BIBLIOGRAPHY**

- Suggested bibliography:

1. Αναγνωστοπούλου, Α. Ταλέλλη, Α., 2008. Τεχνολογία & Ποιότητα Φρούτων & Λαχανικών. ΕΚΔΟΣΕΙΣ Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε. (In Greek)

2. Αρβανιτογιάννης Ιωάννης Σ., Σάνδρου Δήμητρα, Κούρτης Λάζαρος, 2001. Ασφάλεια Τροφίμων. UNIVERSITY STUDIO PRESS - ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΙΑ ΓΡΑΦΙΚΩΝ ΤΕΧΝΩΝ ΚΑΙ ΕΚΔΟΣΕΩΝ (In Greek)

- Related academic journals:

COURSE OUTLOOK

COURCE COORDINATOR/INSTRUCTORS: Nicholaos Danalatos, Professor; Kyriakos Giannoulis, Assistant Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
DEPARTMENT	AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
STUDY LEVEL	GRADUATE		
COURSE CODE	BK1047	**SEMESTER**	9th (FALL)
COURSE TITLE	INTRODUCTION TO CROP GROWTH MODELING		
INDEPENDENT TEACHING ACTIVITIES		**ΕΒΔΟΜΑΔΙΑΙΕΣ ΩΡΕΣ ΔΙΔΑΣΚΑΛΙΑΣ**	**ΠΙΣΤΩΤΙΚΕΣ ΜΟΝΑΔΕΣ**
Lectures and Laboratory Exercises		3	4 ECTS
COURSE TYPE	Specialised general scientific knowledge		
REQUIRED COURSES:	General agriculture – plant physiology –soil science		
LANGUAGE OF TEACHING AND EXAMINATIONS:	Greek		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	NO – There is a possibility of teaching erasmus students		
URL COURSE PAGE			

2. LEARNING OUTCOMES

Learning Outcomes

Knowledge and familiarity with the crop growth simulation models that undoubtedly are basic tools of the geotechnical scientist of the future and in combination with experimental agronomic research will contribute to the rational planning of land use. Simulation models are essential tools to help modern research and development and have undoubtedly contributed to the great advancement of agronomic research at less cost. Through the course, students will be familiarized with the basic principles of simulation, with the models used in the field of their specialty, but in addition they will be given the opportunity to understand the way and the ability to be able to construct initially simple crop groth models, which comprises a stage necessary for their further specialization in the field.

General Competencies

- Data analysis and composition or selection of the most appropriate forecasting model for crop growth
- Autonomous Work
- Team work
- Evaluation and planning of land use (cropping systems)
- Respect to the Environment
- Crop yield forecasts with a smaller deviation range

3. COURSE CONTENT

1. Introduction – Purpose and importance of simulation – Definitions
2. Static models with single variable
3. Static models with multiple more variables
4. Parametric models – Example of cropping systems evaluation
5. Introduction to Dynamic models – Recovery time – Reaction time – Operation time
6. Calibration – Validation of dynamic models – System half time – Minimum simulation interval
7. Introduction to Deterministic models – The methodology of Wageningen school
8. The finite difference method – Step by step Completion – Exercises
9. Production potential – Daily growth rate
10. Exponential – Linear and declining crop growth – Total biomass – Exercises
11. Simple water balance model

12. Simple nutrient balance model for rational fertilization of macro-elements
13. Construction of a simplified model for the development of a crop using EXCELL – Graphical representations

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Lectures - Oral presentations
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Support of the Learning Process through the e-class electronic platform. Present lectures in Power Point, use Microsoft office (Excel etc.)
TEACHING ORGANIZATION	

Activity	Semester Working Load
Lectures	26
Laboratory (tutorial) Exercises	22
Assignment in the context of laboratory (tutorial) exercises	26
Independent Study	26
Course Total (25 study hours load per study unit)	**100**

STUDENTS EVALUATION	Students evaluation includes: 1. Written/oral final examination (70% of final mark) that includes: • Questions requiring elaboration of theoretical issues • Questions requiring short answers • Multiple choice questions 2. Laboratory exercises (30% of final mark): • Evaluation based on laboratory tutorial) exercises • Evaluation based on weekly assignments

5. SUGGESTED BIBLIOGRAPHY

Danalatos, N.G., 2021. Introduction to Crop Growth Modeling. University of Thessaly Press (under publication) – Until publication lecture notes will be distributed to the students.

Functional -Structural Plant Modelling in Crop Production. By J. Vos, LFM Marcelis, PHB de Visser, PC Struik, and J.B. Evers, Springer.

Modelling Potential Crop Growth Processes. Textbook with Exercises. By Authors: Goudriaan, J., Van Laar, H.H. Springer.

10th Semester (Spring)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Nikolaos Katsoulas, Professor; Dr. Christos Cavalaris (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEAPRTMENT OF AGRICULTURE CROP SCIENCE AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	IΦ1005	**SEMESTER**	10th (SPRING)
COURSE TITLE	FARM MACHINERY MANAGEMENT		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures, Practice exercises and Laboratory		4	4 ECTS
COURSE TYPE	Specialized general knowledge		
PREREQUISITE COURSES:	Farm mechanization		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_142/		

2. LEARNING OUTCOMES

Learning outcomes
The course it is completes the basic area of knowledge in agricultural mechanization provided to the students. Efficient machinery use, economic aspects, machinery selection, time of replacement, appropriate combinations of different implements are some of the main objectives of the course. The students meet also with aspects of health and safety during farm operations and they learn about alternative cultivation techniques. Finally, they get a brief introduction into newly emerged technologies such as Precision Agriculture and Farm Management Information Systems. The main target of the course is to provide the students with the necessary skills to be able to make suggestions on machinery selection and to perform machinery economic analysis. They are also provided with some environmental aspects related to the machinery use as also as aspects of health and safety of the users.
General Competences
The scope of the course is to give the students the appropriate skills in order to be able: - To access the economic aspects of farm machinery use - To make suggestions for the appropriate machinery selection - To evaluate the opportunities of alternative cropping techniques. - To identify possible dangers for the user and negative effects for the environment and to be able to suggest appropriate solutions.

3. SYLLABUS

Introduction of basic management issues – Basic issues of physics for mechanics - Energy and agriculture – Fuels –Power performance – Draft forces - Machine performance – Combined implements – Tramlining- Alternative systems of soil tillage – User safety and health – Cost of use for

agricultural equipment – Direct costs – Indirect costs – Tractor selection – Machinery selection – Tractor and machinery replacement – Used machinery selection – Choosing farm machinery management system – Introduction to Precision Agriculture – Introduction to Farm Machinery Management Systems.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	In class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Teaching support via the e-class platform
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Practicing and exercises in small groups focusing on the application and implementation of PA techniques.	26
Private studying	48
Course total	**100**

STUDENT PERFORMANCE EVALUATION	1. Test examinations (50%) 2. Practical examinations (50%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Tsatsarelis K.A. (2006). Farm machinery management Giahoudi puplications, Thessaloniki.
- Hunt D. (1995). Farm Power and Machinery Management. Iowa State University Press.
- Tsatsarelis K.A. (2011). Farm tractors. Giahoudi puplications, Thessaloniki.
- Tsatsarelis K.A. (2000). Principles of soil tillage and sowing, Giahoudi publications, Thessaloniki.

- Related academic journals:
- Transactions of the ASABE. American Society of Agricultural and Biological Engineering. St. Joseph MI. ISSN: 2151-0032.
- Applied Engineering in Agriculture. American Society of Agricultural and Biological Engineering. St. Joseph MI. ISSN: 0883-8542.
- Journal of Agricultural Safety and Health. American Society of Agricultural and Biological Engineering. St. Joseph MI. ISSN: 1074-7583
- Agricultural Engineering International: CIGR Journal http://www.cigrjournal.org/

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Vasileios Antoniadis, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΣΦ0603	**SEMESTER**	10th (SPRING)
COURSE TITLE	SOIL CONTAMINATION. IMPROVEMENT AND MANAGEMENT OF PROBLEM SOILS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4 (2+2)	4
COURSE TYPE	General background		
PREREQUISITE COURSES:	No		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_171/		

2. LEARNING OUTCOMES

Learning outcomes

This module introduces the students to basic principles of soil fertility, and it consists of a teaching and a practical section.

Teaching: It gives students the basic description of soil contamination, the contaminant categories, the ways of measuring and assaying soil contamination, and the ways of soil remediation. It also gives the students the basic principles of the genesis, properties and reclamation of problem soils (acidic, salt-affected, and eroded soils).

Practicals: They aim at making students familiar with laboratory analyses of heavy metals, as well as with quantitative analytical measurements of irrigation water.

When students successfully complete this module, they should:

- Know the basic principles of genesis and remediation of soil contamination
- Know the properties and the ways of reclamation of problem soils
- Be able to carry out laboratory analyses related to contaminated and problem soils

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
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

3. SYLLABUS

Teaching section

- Soil contamination (definitions, industrial, municipal and agricultural wastes, ways of applying them to soil, heavy metals, organic contaminants)
- Problem soils (description of genesis, detrimental effects, reclamation methods). Problem soils include: Salt-affected, acidic and eroded soils. .

Practicals section

- Methods of reclaiming acidic soils
- Analysis and evaluation of irrigation water

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	● Teaching in the class with Power Point. ● Support of teaching activity via the e-class platform
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Practicals	26
Assignment on a topic related to soil contamination	30
Self-study	18
Total per module (25 hours of workload per ECTS unit)	**100**

STUDENT PERFORMANCE EVALUATION	I. Written examinations (80%) II. Practicals (20%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1. «Εδαφολογία: Η Φύση και οι Ιδιότητες των Εδαφών», Brady, R.R. and Weil, N.C. (In Greek)
2. Μισοπολινός, Ν. 2010. Προβληματικά Εδάφη. (In Greek)
3. Κωτσοβίνος, Ν. 2010. Ρύπανση και Προστασία Περιβάλλοντος. (In Greek)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Christos Lykas, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1048	**SEMESTER**	10th (SPRING)
COURSE TITLE	LANDSCAPE ARCHITECTURE AND URBAN GREEN INFRASTRUCTURES		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4
COURSE TYPE	Special background		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes in English		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_110/		

2. LEARNING OUTCOMES

Learning outcomes
This course focuses on the development of flexible design processes for landscape design. Principles for outdoor large and small scale urban, suburban and free land space are analyzed in order to transform an to a functional, aesthetic, safe and attractive space Students are guided in designing outdoor spaces combining natural and artificial materials in order to achieve a sustainable result. After course completion, student will: ▪ Understand the basic small and large open spaces design principles. ▪ Be able to plan outdoor space to meet the needs of specific areas. ▪ Be able to combine plants, natural and artificial materials in order to achieve a functional and aesthetic result. ▪ Be able to design green roofs space and manage vertical planting projects.
General Competences
Decision-making Adapting to new situations Working independently Team work Production of new ideas Search for, analysis and synthesis of data and information, with the use of the necessary technology Working in an international environment Project planning and management Respect for the natural environment

3. SYLLABUS

- Scales and drawing instruments.

- The history of Landscape Architecture.
- Natural and artificial landscape.
- Basic principles for the synthesis of a landscape project.
- The plants as functional and aesthetic design elements.
- Criteria for the selection of plant material.
- Technical standards and regulations.
- Irrigation of small and large land spaces.
- Landscape planning process.
- Compilation of a full project.
- Restructuring and regeneration of free and planted spaces.
- Roof gardens.
- Vertical planting.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Lectures in class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	E-class facilities Plant data base
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice	26
Projects	30
Project presentation	18
Course total	**100**

STUDENT PERFORMANCE EVALUATION	Language of evaluation: Greek Final exams performed by: Project development and analysis (80%) Project presentation (20%)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:

1. Konijnendijk, Cecil.Nilsson, Kjell.Randrup, Thomas.Schipperijn, Jasper, 2005. Urban Forests and Trees. Springer-Verlag Berlin Heidelberg.
2. Mander,Ülo.Helming, Katharina.Wiggering, Hubert, 2007. Multifunctional Land Use. Springer-Verlag Berlin Heidelberg

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Efthimia Levizou, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1035	**SEMESTER**	10th (SPRING)
COURSE TITLE	PLANT STRESS PHYSIOLOGY		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises	4	4 ECTS

COURSE TYPE	Specialised general knowledge
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_179/

2. LEARNING OUTCOMES

Learning outcomes
By the end of this course, the students will: 1) Know and be able to define the border of optimal plant performance and the deviation from this due to suboptimal or damaging quantities/intensities of environmental factors, i.e. situations for which we use the term stress. 2) Understand the mechanisms through which abiotic and biotic environmental stress factors affect plant physiology and productivity (from sub-cellular to ecosystem level). 3) Address certain adaptation-mitigation strategies employed by plant in order to overcome various environmental stress factors.
General Competences
Basic and specialized knowledge of the natural world Working independently Team work Working in an interdisciplinary environment Production of new research ideas Respect for the natural environment

3. SYLLABUS

Introduction: Environmental stress conditions and plant response strategies Water Stress Salt Stress Temperature stress Light stress: excess light and shade effects on plant function and productivity Oxidative stress

Heavy metals Low-oxygen stress Mechanically-induced stress Biotic stress and plant responses and defense

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	➢ PowerPoint use in lectures ➢ Teaching support by e-learning platform ➢ Communication with students with e-mails via e-learning platform
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures/interactive teaching</td><td>26</td></tr><tr><td>Laboratory practice</td><td>26</td></tr><tr><td>Team work in report preparation and oral presentation of a given plant physiological procedure</td><td>23</td></tr><tr><td>Non-directed study</td><td>25</td></tr><tr><td>Course total</td><td>100</td></tr></table>
STUDENT PERFORMANCE EVALUATION	Written final examination (70%), including: -multiple choice questionnaires - short-answer questions - problem solving/ short-answer questions concerning laboratory practice Laboratory work and students lectures (30%)

5. ATTACHED BIBLIOGRAPHY

-Suggested bibliography:

1) Plant stress physiology, Karabourniotis G., Liakopoulos G., Nikolopoulos D., Publisher: Embryo; 2012 (in Greek).
2) Plant stress physiology, S. Shabala, CABI; 2012

-Related academic journals:

Plant Physiology
The New Phytologist
Functional Plant Biology
Journal of Experimental Botany
Environmental and Experimental Botany
Journal of arid environments

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Olga Gortzi, Professor; Evlalia Koufostathi (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΦΖ1004	**ΕΞΑΜΗΝΟ ΣΠΟΥΔΩΝ**	10th (SPRING)
COURSE TITLE	FOOD SAFETY AND QUALITY ASSURANCE		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and	2	4 ECTS
Laboratory exercises	2	

COURSE TYPE	Specialized general scientific knowledge
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_113/

2. LEARNING OUTCOMES

Learning outcomes

The course learning outcome is basic scientific knowledge in Food Science.
The target of the course is the understanding of the meaning of Food Quality and Safety and also their importance for the Food Industry.
The students with the successful completion of the course will be able to:

- Understand the importance of food safety and quality assurance
- Locate and apply the total support of quality assurance from raw production to manufacturing, distribution and consumption of the finished product
- Detect biological, chemical and physical hazards in food industries, restaurants e.t.c

General Competences

- Working independently
- Team work
- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Production of free, creative and inductive thinking
- Project planning and management

3. SYLLABUS

- Introduction to food safety and quality assurance and its importance.
- The food safety systems and their basic principles
- The history of introduction HACCP
- Presentation and analysis of the main principles of food safety standards
- Examples in Food and Drink Industries

- Analysis of the cycle life of Food products from the production until the end and its return to nature.
- Other important standards and regulations
- ISO 14000 and ISO 9000

4. TEACHING AND LEARNING METHODS - EVALUATION

LECTURES – ORAL PRESENTATIONS	Face-to-face, in class
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Use of ICT in teaching, laboratory education, communication with student
TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice, in the basic principles of food safety and quality assurance	26
Study and analysis of bibliography-team work (project)	20
Educational visits / Individual projects	10
Student's study hours	18
Course total	**100**

STUDENT PERFORMANCE EVALUATION	I. Final written exams (multiple choice questionnaires, short-answer questions) or/and II. Team work (project) - presentation III. Laboratory work (optionally)

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Τσάκνης Ιωάννης, 2018. Ποιότητα και Ασφάλεια Τροφίμων και Ποτών. Εκδόσεις Α. ΤΖΙΟΛΑ & ΥΙΟΙ Α.Ε. (In Greek)
2. Αρβανιτογιάννης Ιωάννης Σ., Σάνδρου Δήμητρα, Κούρτης Λάζαρος, 2001. Ασφάλεια τροφίμων. UNIVERSITY STUDIO PRESS - ΑΝΩΝΥΜΟΣ ΕΤΑΙΡΙΑ ΓΡΑΦΙΚΩΝ ΤΕΧΝΩΝ ΚΑΙ ΕΚΔΟΣΕΩΝ. (In Greek)

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Kyrialos Giannoulis, Assistant Professor

1. GENERAL

SCHOOL	SCHOOL OF AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	HΦ0805	**SEMESTER**	10th (SPRING)
COURSE TITLE	AROMATIC, MEDICINAL AND ENERGY PRODUCTION PLANTS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4
COURSE TYPE	Skills Ddevelopment		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_111/		

2. LEARNING OUTCOMES

Learning outcomes
The course «Aromatic and Medicinal Plants and Bio-energy Plants» offers an adequate knowledge on the development, classification and description of a number of Aromatic and Medicinal plants of the Greek flora. It presents the ways of their propagation and cultural techniques, and analyzed the ecology and significance of a number of biomass Crops that can be cultivated for bio-energy production (bio-fuel, bio-gas, bio-diesel), as well as for production of paper pulp and construction materials.
General Competences
● Search for, analysis and synthesis of data and information, with the use of the necessary technology ● Team work ● Project planning and management ● Respect for the natural environment ● Production of free, creative and inductive thinking

3. SYLLABUS

Among the aromatic and medicinal plants included in the course are the following: Ocimum basilicum, Geranium roseum, Jasminum grandiflorum, Glycyrrhiza glabra, Laurus nobilis, Rosmarinus officinalis, Origanum dictamus, Eucalyptus spp., Thymus spp., Coriandrum sativum, Lilium candidum, Crocus sativus, Cuminum cyminum, Lavandula spp., Foeniculum vulgare, Origanum majorana, Melissa officinalis, Mentha longifolia, Origanum heracleoticum, Spartium junceum, Sideritis scardica, Rosa spp., Tilia cordata, Matricaria chamomilla. In the bio-energy plants are included: Hibiscus cannabinus, Brassica colza, Helianthus tuberosus, Miscanthus sinensis etc. In particular for each plant the following aspects are discussed: economic importance, botanic characteristics, propagation and breeding objectives, ecological conditions, cultivation practices, and processing of the products.

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>MODES OF DELIVERY</td><td>Class attendance</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Power point presentations. Student contact electronically.</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>Laboratory and field work</td><td>26</td></tr>
<tr><td>Homework: Organizing and presenting a plant collection (herbarium)</td><td>22</td></tr>
<tr><td>Autonomous study</td><td>28</td></tr>
<tr><td>Course total</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>● Final written exams (50%)
● Written work, Public Presentation (50%)</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
1. Dordas Christos . 2012. Aromatic and medicinal plants. Publications Modern Education.
2. Katsiotis Stavros , Paschalina Chatzopoulou . 2010. Aromatic medicinal plants and essential oils. Publications Kyriakides Bros.
3. Koutsos Theodore . 2007. Aromatic and medicinal plants. Ziti Publications.
4. Vogiatzi – Kamvoukou Eleni.2004. Selection of aromatic & medicinal plants. . Publications Modern Education.

- Related academic journals:
International Journal of Medicinal and Aromatic Plants, Journal of Applied Research on Medicinal and Aromatic Plants, World Research Journal of Medicinal & Aromatic Plants, Medicinal & Aromatic Plants, Bioenergy Research.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Christos Nakas, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	AGRICULTURE CROP PRODUCTION & RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1040	**SEMESTER**	10th (SPRING)
COURSE TITLE	BIOINFORMATICS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_116/		

2. LEARNING OUTCOMES

Learning outcomes
Level 6: Biological database construction and organization, pattern recognition, sequencing, multivariate data analysis. Use of computer s/w and IT skills development.
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Decision-making Working independently Working in an international environment Working in an interdisciplinary environment Production of new research ideas

3. SYLLABUS

Construction and management of biological databases, DNA microarrays. Pattern recognition, sequencing, alignment, multivariate data analysis, machine learning. Use of specialized s/w (R, Python, C++).

4. TEACHING and LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of ICT in teaching, e-class (notes, exercises, communication w students), applications at computer room/lab.
TEACHING METHODS	

Activity	**Semester workload**
Lectures	26

	Lab/practice	26
	Essay writing	23
	Study and analysis of bibliography	25
	Course total	**100**
STUDENT PERFORMANCE EVALUATION	Written exams (problem solving) 70%, public presentation (5-20%), written work 10-25%. Evaluation criteria/results accessible to students at the lab.	

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

- Bioinformatics and molecular evolution, Higgs & Attwood, Blackwell 2012

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Georgios Nanos, Professor; Christos Lykas, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTEMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΙΦ1002	**SEMESTER**	10th (SPRING)
COURSE TITLE	ASEXUAL PLANT PROPAGATION		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_168/		

2. LEARNING OUTCOMES

Learning outcomes

The course is skill development on the major subject of plant propagation production in horticultural industry. The course material targets to the deep understanding of asexual propagation methods, their combinations to produce salable plant material and the functioning of plant propagation operations.

The course also provides basic knowledge on plant anatomy and physiology, adventitious root formation, tissue culture, sustainable plant propagation material production and management of inputs, equipment and constructions used in plant propagation.

Finally, the scope of the course is the development of complete knowledge for plant propagation in horticulture to produce certified plant material.

With the successful completion of the course the student will have:

- The basic knowledge on the methods and techniques used in sustainable production of propagation material in pomology, viticulture and, in many cases, in vegetable and ornamental plant propagation
- Has the capacity to explore, evaluate and use new knowledge from literature sources outside the ones used in the course
- Is able to study and discriminate the critical points needing improvements in a plant propagation facility or develop a study for the establishment and guide the developers for a new plant propagation establishment to successful results
- Is in position to understand and evaluate the negative consequences from a biotic or abiotic factor to the crop and is able to find preventive or curative methods to avoid or minimize negative consequences
- Has the basic communication skills to interact with his/her co-students, instructor and various stakeholders in plant propagation matters.

General Competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Decision-making Working independently Team work Project planning and management

3. SYLLABUS

Introduction to asexual plant propagation: history, necessity, course content, problems, applications What is variety, cultivar, clone. The environment in plant propagation and its modification. Substrates and containers. Seed uses in asexual propagation: dormancy, germination, treatments Cuttings: physiology, anatomy, factors affecting rooting of cuttings, mother plantation, cutting types, treatment before, during and after cutting and rooting, important uses of cuttings in horticulture. Budding, grafting: anatomy, factors affecting budding success, equipment, techniques for budding and grafting, applications to horticultural crops Layering - Suckers – Division: techniques, usefulness, applications to horticultural crops Underground propagation organs: physiology and annual cycle, types and species uses, the steps from production to storage of underground propagation material Tissue culture: techniques and uses, basic principles of tissue culture, applications to horticultural crops Nursery production of horticultural crops: step-by-step use of all necessary techniques to produce propagation material Nursery operations: requirements in equipment and structures, organization, legal requirements, certification of propagation material

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of powerpoint presentations in lectures, use of internet and electronic and hard-copy library resources for solving real-life problems
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Class teaching</td><td>26</td></tr><tr><td>Laboratory exercises</td><td>16</td></tr><tr><td>Field trips</td><td>8</td></tr><tr><td>Field exercises to Experimental Farm</td><td>20</td></tr><tr><td>Case study</td><td>10</td></tr><tr><td>Autonomous study</td><td>20</td></tr><tr><td>Course total</td><td>100</td></tr></table>
STUDENT PERFORMANCE EVALUATION	Written examinations (80% to the final grade), case study oral and written presentation (10%), participation and final exam to laboratory material (10%) The written exams consist of short answers to descriptive and real-life problem solving questions based on study material given as book and notes by the instructor and additional material available in the laboratory of Pomology and the departmental library.

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. K.A. Pontikis, Propagation of Fruit Trees and Shrubs, Stamoulis Publ., Athens, 1994, p. 269
2. K. Dimasi-Theriou and J.N. Therios, General Pomology, Part A', Propagation and Rootstocks of Fruit Trees, Gartaganis Publ., Thessaloniki, 2006, p. 476
3. E.P. Eleftheriou, Technology of Plant Propagation Material, Art of Text Publ., Thessaliniki, 1994
4. S.E. Kintzios, Tissue Culture Business, Stamoulis Publ., Athens, 1994
5. A. Toogood, Propagating Plants. Dorling Kindersley, London, 1999
6. H.T. Hartmann, D.E. Kester, F.T. Davies and R.L. Geneve, Plant Propagation. Prentice Hall, New Jersey, 2007
7. Instructors' notes on recent advances for the course subjects

- Related academic journals:

HortScience, HortTechnology,
Scientia Horticulturae, Acta Horticulturae,
European J. Horticultural Science

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Nikolaos Papadopoulos, Professor

1. GENERAL

SCHOOL	AGRICULTURAL STUDIES		
ACADEMIC UNIT	AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΦΖ1002	**SEMESTER**	10th (SPRING)
COURSE TITLE	APICULTURE – SERICULTURE		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		3	4
COURSE TYPE	SPECIAL BACKGROUND, SKILLS DEVELOPMENT		
PREREQUISITE COURSES:	NONE		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (IN ENGLISH) TUTORING		
COURSE WEBSITE (URL)	https://eclass.uth.gr/modules/auth/courses.php?fc=54		

2. LEARNING OUTCOMES

Learning outcomes

Taxonomy and honey bee strains, Honey bee social structure and development within the beehive, Anatomy and physiology, Beehive characteristics, Nutrition, Activity and behavior, Swarming, Apiary equipment, Practice of apiculture, Beehive products, Pests – Diseases, Sericulture.

Theory and practice of Apiculture – Sericulture. Attaining basic knowledge of apiculture regarding the organization and the development of the social structure of honeybee, the means of communication, the reproduction and the practice of apiculture. Lectures include narrated and visual (photos and video) presentations aiming at student familiarity with honeybees' diseases that are hard to locate during beehive inspection. Practical implication of the knowledge attained during narrated presentations of Apiculture-Sericulture. Video presentation of specialized handling during applied apiculture. Simple apiculture handling and treatment and discovering of beehive products. Demonstration of beekeeping equipment as well as of typical equipment of laboratory for honey chemical analysis.

Students who complete the course will acquire knowledge of (a) apiculture and sericulture, (b) structure and function of bees' societies, and the will be capable of (c) performing basic functions of beekeeping and honey quality analysis

General Competences

- Respect for the natural environment
- Working in an interdisciplinary environment
- Team work

3. SYLLABUS

- Taxonomy and biology of bees

- Morphology and anatomy
- Hive, castes and communication of bees
- Feeding and noutrition of bees
- Polination
- Ethology and swarming
- Beekeping materials and methods
- Seasonal beekeping procedures
- Hive pests
- Beekeping products
- Bombix mori and sericulture

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Class attendance
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Distribution of power point presentations, i-books, video, quiz, Educational process is supported by the online platform e-class.
TEACHING METHODS	<table><tr><th>Activity</th><th>Semester workload</th></tr><tr><td>Lectures</td><td>26</td></tr><tr><td>Laboratory exercises</td><td>26</td></tr><tr><td>Study</td><td>48</td></tr><tr><td>Course total</td><td>100</td></tr></table>
STUDENT PERFORMANCE EVALUATION	I. Final examination (80%) ● multiple choice questions ● short answer questions ● written work on practical and theoretical fields II. Exams on subjects of the laboratory exercise (20%) III. the opportunity of midterm exams is offered

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
- Related academic journals:
  - Charizanis, P. 1993. The honey bee and the beekeeping techniques. Charizanis Thessaloniki Greece

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTOR: Y. Stamboulis, Associate Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΕΠΕΑΕΚ2	**SEMESTER**	10th (SPRING)
COURSE TITLE	DEVELOPMENT OF BUSINESS PLANS		

INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises	4	4

COURSE TYPE	Specialized general knowledge, skills development
PREREQUISITE COURSES:	-
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)
COURSE WEBSITE (URL)	http://business-plans.moke.uth.gr/

2. LEARNING OUTCOMES

Learning outcomes
The **objective** of this course is to provide the students with basic knowledge on the development of successful and complete business plans.
General Competences
• Project planning and management • Decision-making • Team work • Working in an interdisciplinary environment • Production of free, creative and inductive thinking

3. SYLLABUS

Content: the course, indicatively, will focus on questions that concern:

Exploration of business opportunities, definition of the needs of users (market research), development of business plans, investment assessment and planning, financing of start-ups (venture capital, business angels etc), management of brand names and trademarks, development of business collaborations.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	Face to face (in the classroom) and team meetings
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Support through the course website, electronic management tools.

TEACHING METHODS	

Activity	Semester workload
Lectures	26
Laboratory practice / coaching	26
Team project / business idea	22
Study and analysis of bibliography	26
Course total	**100**

STUDENT PERFORMANCE EVALUATION	I. Team project (business plan): 80% II. Project presentation: 20%

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. Spinelli S., Rob A. (2011) New Venture Creation 9th ed., McGraw-Hill/Irwin.
2. Ries E. (2011), The Lean Startup, Crown Business.

COURSE OUTLINE

COURCE COORDINATOR/INSTRUCTORS: Persefoni Maletsika, Assistant Professor; Georgios Nanos, Professor

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	BK1049	**SEMESTER**	10th (SPRING)
COURSE TITLE	OLIVICULTURE		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and laboratory exercises		4	4 ECTS
COURSE TYPE	Skills development		
PREREQUISITE COURSES:	Plant Physiology, Pomology I		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)			

2. LEARNING OUTCOMES

Learning outcomes

The course is a continuation of Pomology I with specialization in olive cultivation and fruit postharvest management.

The lecture and laboratory material targets to offer sufficient scientific knowledge on olive cultivation, with emphasis on micro-environments olive is cultivated in Greece, genetic material available, olive tree-leaf-fruit physiology, olive and its relationships with the environment, specific cultivation practices with various case studies available to produce high quality and quantity olive fruit and its products.

The course also covers more general information with its applications in olive cultivation on sustainable resource use, crop production certification, environmentally-friendly plant production techniques, the effects of cultivation practices on the plant and its products, the humans and the environment, so that the student will develop a total understanding of the processes and methods for sustainable cultivation of olive, the most important tree crop in Greece.

Finally, the central scope of the course is the acquisition of thorough knowledge on the processes taking place in the olive tree and fruit, and all necessary cultivation practices required for the environmentally-friendly production of olive fruit and olive oil and the rest of olive orchard products.
With the completion of course requirements the student is able to:

- *Has the basic knowledge of the tools and techniques to sustainable olive tree cultivation, olive orchard management and fruit harvest and postharvest handling for processed table olives and olive oil*
- *Has the capacity to explore, evaluate and use new knowledge from literature sources outside the ones used in the course*
- *Is able to study and discriminate the critical points needing improvements in an olive related company or study the establishment and guide the developers for a new olive plantation establishment to successful results*
- *Is in position to understand and evaluate the negative consequences from a biotic (environmental factors) or abiotic factor to the olive crop and is able to find preventive or curative methods to avoid or minimize negative consequences*

- *Has the basic communication skills to interact with his/her co-students, instructor and various stakeholders in olive tree cultivation matters.*

General Competences

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Decision-making
Working independently
Team work
Working in an interdisciplinary environment
Project planning and management
Respect for the natural environment
Production of new research ideas

3. **COURSE SYLLABUS**

Importance of olive cultivation in Greece and the world. Olive plant and fruit description.
Olive Greek and international cultivars. Olive and its inter-relations with the natural environment.
Olive plant ecology and management of weather effects on olive plant health.
Olive tree, leaf and fruit physiology.
New olive orchard establishment – Super-high density plantations.
Training and pruning olive tree.
Weed management – Fruit thinning techniques.
Irrigation of olive orchards.
Olive plant fertilization: nutrient requirements.
Olive plant fertilization: sustainable fertilization practices.
Plant protection: management of major diseases and insects.
Olive fruit ripening physiology – Storage of fresh olive fruit.
Olive oil production and management – Olive fruit processing.

4. **TEACHING AND LEARNING METHODS - EVALUATION**

LECTURES - ORAL PRESENTATION	*Class attendance*
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	Use of powerpoint presentations in lectures, use of internet and electronic and hard-copy library resources for solving real-life problems
TEACHING METHODS	
STUDENT PERFORMANCE EVALUATION	Written examinations (80% to the final grade), case study oral and written presentation (20%) The written exams consist of short answers to descriptive and real-life problem solving questions based on study material given as book and notes by the instructor and additional material available in the laboratory of Pomology and the departmental library. Case study subject is given by the instructor at the beginning of the semester and presented at the end of the semester

Activity	Semester workload
Class teaching	26
Laboratory exercises	14
Field trips	20
Case study	10
Autonomous study	30
Course total	100

5. **RELATED LITERATURE**

-Suggested Literature:

1. Therios J.N. 2005. Olive Cultivation, Gartaganis Publ., Thessaloniki, p. 528.
2. Kyritsakis A. 2007. Olive oil, table olives and olive paste, Kyritsakis A. ed., p. 674.

3. Kyritsakis A. 2022. Table olives and their biofunctional role, Kyritsakis A. ed., p. 450.
4. Instructor's notes on recent advances for the course subjects.

- Related academic journals:
HortScience
HortTechnology
Scientia Horticulturae
Acta Horticulturae
Fruits
Olivae
European J. Horticultural Science

COURSE OUTLINE

COURSE COORDINATOR/INSTRUCTORS: Evangelos Vellios, Associate Professor; Dr. Fevronia Lioliopoulou (Laboratory Teaching Staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE STUDIES		
COURSE CODE	BK1050	**SEMESTER**	10th (SPRING)
COURSE TITLE	DISEASES OF VEGETABLE CROPS		
INDEPENDENT TEACHING ACTIVITIES		**WEEKLY TEACHING HOURS**	**CREDITS**
Lectures and Laboratory exercises		4	4 ECTS
COURSE TYPE	Specialised training		
PREREQUISITE COURSES:	General Plant Pathology		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (in English)		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/AGR_U_122/		

2. LEARNING OUTCOMES

Learning outcomes
Upon successful completion of this course, students will be able to: • recognize symptoms and signs and identify the cause of the most important diseases of vegetables, ornamentals and field crops. in Greece • advise farmers regarding the methods and proctices for control of these diseases in sustainable agriculture
General Competences
Search for, analysis and synthesis of data and information, with the use of the necessary technology Make decisions Work autonomously Respect natural environment Advance free, creative and causative thinking

3. SYLLABUS

Diseases of vegetable crops (tomato, pepper, potato cucumber, brassicas, foliage vegetables, onion, beet and legumes) caused by fungi, prokaryotes, viruses and environmental factors.

4. TEACHING AND LEARNING METHODS - EVALUATION

MODES OF DELIVERY	In-person

<table>
<tr><td>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</td><td>Power point presentations.
Communication with ICT.</td></tr>
<tr><td>TEACHING METHODS</td><td><table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Lectures</td><td>26</td></tr>
<tr><td>Laboratory excercises</td><td>26</td></tr>
<tr><td>Assignment</td><td>30</td></tr>
<tr><td>Student independent work</td><td>18</td></tr>
<tr><td>Course total</td><td>100</td></tr>
</table></td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>1. Lectures final written/oral exams (80% of the final grade).
2. Assignment (20% of the final grade).
3. Laboratory exercises evaluation (pass-fail)</td></tr>
</table>

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
1. Panagopoulos, C.G. (1995). "Diseases of Vegetables". Publisher: Stamoulis, Athens, Greece. (In greek).
2. Koike, S.T., Gladders, P. & Paulus, A.O. (2007). "Vegetable Diseases. A color handbook".The American Phytopathological Society, St Paul, Minnesota.: Stamoulis, Athens, Greece. (In greek).

- Related academic journals:
Plant Pathology, Plant Disease, European Plant Pathology, Phytopathology, Molecular Plant Pathology.

Graduation Thesis

OUTLINE

Responsible: The major professor (Academic staff)

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF AGRICULTURE, CROP PRODUCTION AND RURAL ENVIRONMENT		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	ΠΤΥΧ	**SEMESTER**	9th and 10th
COURSE TITLE	Thesis		
INDEPENDENT TEACHING ACTIVITIES	**Graduation Thesis Responsible: the major professor (Departmental teaching staff)**		**CREDITS**
Research Thesis elaboration	9th Semester		14
	10th Semester		16
	ECTS		30
COURSE TYPE	Scientific Area		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION AND EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	-		

2. LEARNING OUTCOMES

Learning outcomes
With the successful completion of the thesis the students are capable to: a) deepen their knowledge on certain scientific area of agriculture using the acquired knowledge developed during their studies. b) search the scientific information using various databases and sources, to independently compose the scientific information, to lay down and organize experiments, to acquire and apply experimental procedures, to analyze and process scientific data, to write scientific text, to present with critical thinking the results of their research (underlining the importance and contribution to the particular scientific area). c) organize and present publicly a scientific work or subject. d) incorporate, adapt and collaborate with scientific research teams and in the experimental laboratory environment.
General Competences
✔ Adapt to new situations ✔ Search, analyze and compose data and information, using the available IT ✔ Decision making ✔ Autonomous work ✔ Working in a trans-scientific environment ✔ Development and exploitation of new research ideas ✔ Design and management of projects ✔ Advancement of free, constructive advancing thinking ✔ Self-evaluation and fair criticizing

✔ Responsibility social, professional and ethical

3. SYLLABUS

Search of related scientific literature related to the subject of the thesis Design and organization of experiments/research Application of protocols and experimental procedures Collection of scientific results/data Statistical analysis and evaluation of scientific results/data Thesis writing and presentation

4. TEACHING AND LEARNING METHODS - EVALUATION

<table>
<tr><td>MODES OF DELIVERY</td><td>Class attendance</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES</td><td>Database search for literature exploitation, presentation with laptop and projector, software use (powerpoint, statistical software, excel)</td></tr>
<tr><td>TEACHING METHODS</td><td>
<table>
<tr><th>Activity</th><th>Semester workload</th></tr>
<tr><td>Search, collection and comprehension of literature</td><td>130 hours</td></tr>
<tr><td>Organization and implementation of research/experiments</td><td>400 hours</td></tr>
<tr><td>Writing thesis</td><td>200 hours</td></tr>
<tr><td>Thesis presentation</td><td>20 hours</td></tr>
<tr><td>Course total</td><td>750 hours</td></tr>
</table>
</td></tr>
<tr><td>STUDENT PERFORMANCE EVALUATION</td><td>-Writing the thesis and publicly presenting and supporting the thesis. The thesis is presented and supported in an open one- or two- day meeting three times per year. The final thesis evaluation and grading is performed after the presentation from a three-member evaluation committee (consisting of departmental or outside teaching staff).
-The committee members grade the thesis based on the written thesis and the public presentation/supporting of the thesis.
-Each member of the evaluation committee grades the thesis separately and the final thesis grade is the mean of the three committee grades with lowest acceptable grade the five (5.0).</td></tr>
</table>

5. ATTACHED LITERATURE

- Suggested literature:

Gastel B. and R.A. Day 2016. How to write and publish a scientific paper. ABC-CLIO, California

Kaltsikis Pantousis, 1997. Agricultural experimentation – Simple experimental design. 3rd ed., Stamoulis S.A., Athens, pp. 464 (in Greek).

Kaltsikis Pantousis, 1989. Agricultural experimentation – Factorial experimental design. 2nd ed., Stamoulis S.A., Athens, pp. 296 (in Greek).

Kaltsikis Pantousis, 1990. Agricultural experimentation tables. 3rd ed., Stamoulis S.A., Athens, pp. 272 (in Greek).

Annex C in Undergraduate Studies Regulatory Procedures of the Department of Agriculture, Crop Production and Rural Environment