

# **FACULTY OF AGRICULTURE TECHNOLOGY, FOOD TECHNOLOGY AND NUTRITION**

## **DEPARTMENT OF AGRICULTURE TECHNOLOGY**

### **1. Curriculum Description**

#### **1.1 Curriculum Title**

The Department of Agriculture Technology stems from the merging of the three Departments of the former School of Agricultural Technology at Technological Educational Institution of Epirus: Dept. of Crop Production, Dept. of Animal Production and Dept. of Floriculture and Landscape Architecture. Today the three former departments constitute three distinct divisions of the new Dept. of Agriculture Technology.

After successful external evaluation in 2012 concerning the structure and work produced by the old undergraduate curriculums (OUC) of the three former departments, the new School/Faculty of Agriculture Technology & Food Technology and Nutrition of TEI of Epirus sustained its scientific structure and philosophy of the previous independent departments' OUCs, with some minor upgrading.

The Department of Agriculture Technology dept. of TEI of Epirus comprises in its entity from the merging of the already highly ranked internal, intermediate annual, and external evaluations. The department boasts the most research programs to faculty ratio among all departments at TEI of Epirus as well as much collaboration with related businesses.

The latest external evaluation reports of the three directions of the Dept. of Agriculture Technology of TEIEP can be found at:

- Animal Production  
[http://www.adip.gr/external/TEIEpirus\\_Animal%20Production\\_2011.pdf](http://www.adip.gr/external/TEIEpirus_Animal%20Production_2011.pdf)
- Crop Production  
[http://www.adip.gr/external/TEIEpirus\\_CropProduction\\_2011.pdf](http://www.adip.gr/external/TEIEpirus_CropProduction_2011.pdf)
- Floriculture - Landscape Architecture  
[http://www.adip.gr/external/TEIEpirus\\_FloricultLandArch\\_2012.pdf](http://www.adip.gr/external/TEIEpirus_FloricultLandArch_2012.pdf)

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#### **1.2 Curriculum Scope and Content**

The curriculum of the Agriculture Technology Dept. at TEI of Epirus covers the entire spectrum of the Agricultural and Biological sciences with emphasis on Crop Production, Animal Production, and Floriculture and Landscape Architecture, applied through the most up to date - technologically and scientifically - advanced methods of teaching and learning. It is the department's mission to advance the development and conduction of knowledge in science and technology, with the teaching and applied research, equipping its students for further professional development.

The department follows a mixed undergraduate curriculum sharing its first two common semesters with all divisions encompassing core courses of basic fundamental knowledge that can support further specialized insights into each of the three divisions. While being exposed to introductory concepts of all three divisions, the student has ample time and background knowledge available in order to decide and choose the division that suits him best.

### **Procedure of reevaluation, adjustment and updating course material**

This procedure primarily involves scientific areas where development is rapid and significant (biotechnology, food technology, genetics, plant protection). Every four years, the Department has the ability to update the curriculum and modify recommended references. Moreover, new text books are incorporated every year in the EUDOXOS program. Alternatively, the Department is trying to enhance multiple literature reading. The Department's list of multiple literatures has been decided to be distributed the academic year 2014-2015 and has been already posted on its official website. Furthermore, the students have the ability to select a book title through the proposed number of scientific references of the Eudoxos programme website (<http://eudoxus.gr/>).

Courses taught in the new common curriculum are divided into:

- a) Core courses, which are offered in the first two semesters and are mandatory for all students. They consist of introductory issues for all three divisions of the Department. Their content is based upon basic knowledge necessary to understand the disciplines of agricultural science and landscape architecture. Each student has the opportunity to understand/appreciate the importance of all specializations offered by the department and follow the division fittest to his/her preferences.
- b) Specialization (Division) courses, taught from the third semester onwards. The content of these courses are tailored to the needs of individual divisions. Depending on the learning requirements of each division, these courses cover a wide range of subjects which fit well with the Department's type and level of education.

The content of the curriculum is structured to provide options, flexibility and adaptability to individual needs and requirements of departmental students (choice of course selection in higher semesters and the possibility of choosing between courses of three directions), widening the scope of knowledge and adapting to individual requirements and aspirations. The flexibility of student choice is reflected in the possibility to decide with minimum requirements which direction he/she wants to follow. In addition, the Department through the appointed Directors per semester will consult with students, recognize their needs and facilitate in multiple levels. The best ranked students get rewarded either by inclusion in research projects (22 undergraduate students have been integrated and 26 participate voluntarily), or employment in specific workshops that interest them. Certainly the Department operates vice versa as well, tailoring their students to international academic standards.

The degree of linkage between teaching and research consists a major achievement of the Department obtained by:

1. Integration of students in the research process at the undergraduate level, resulting in the production and publication of research. During the years 2008-2014 the department participated with 86 papers in 46 peer-reviewed International Conferences, 19 of which reflected student's work.
2. Undergraduate student terminal projects associated with research activities of the department as either literature reviews or scientific experimentation. 14% of graduate student work related to research the four years 2008 to 2012 was recorded as opposed to the previous four years where there was none reported.
3. 22 undergraduate students have been integrated into research projects initiated and prepared by the department during the period 2008-2015.
4. Development of interface projects in the productive sectors of the agri-food business integrating students of the department.

### **International dimension of the curriculum**

By means of adopting new subjects from contemporary science developments, the program has been fully mapped in the professional rights of graduates, according to international curricula. It is highly competitive with the respective curricula of Agricultural Faculties of Universities and respective departments of other colleges.

The implementation of ECTS credits in the educational process and the implementation of the Diploma Supplement in English have given the curriculum a further opportunity to be matched with those of European universities and facilitate exchanges between scientific staff and students.

Research joint projects with Universities from Ireland, Italy, Spain and China, offer international creditability of the curriculum and facilitate staff and student mobility, science upload and innovative scientific knowledge exchange

### **Brief Structure of Curriculum**

The duration of studies at the Department of Agricultural Technology at TEI of Epirus is eight (8) semesters, including practical training in a professional practice. During the first seven (7) courses, studies include theoretical teaching (lectures), laboratory exercises, seminars, educational trips in floral businesses, biotopes, landscape architecture firms, as well as the writing of scientific papers, focusing on scientific study and team work. The eight (8) semester includes Practical Training in a Professional Practice and undertaking of the Terminal Project.

For students to receive their undergraduate degree, they must:

- Attend and pass successfully all Mandatory (M) courses of the seven (7) semesters [a total of thirty seven (37) lectures] plus an added three (3) mandatory electives (ME) courses, selecting from corresponding course groups
- Undertake, present and successfully pass the terminal project

- To complete a full semester of practical training in a professional practice accumulating a total of 240 credits (ECTS).

### **Curriculum Courses**

The Curriculum of studies for the new Department of Technological Agronomists includes a total of 40 courses, of which:

- 36 are Core (C),
- 4 are Electives (E), organized in three groups of teaching subjects (Groups B, C, and D),

The curriculum structure is provided in the site of the Department: <http://tegeo.teiep.gr>

After course completion, the graduate can practice the following sub-fields in each division:

#### **A. Crop Production**

Crop production division employs:

- The Farm management – crop production management
- The Post-harvest handling of crops (standardization, maintenance, certification and quality control).
- The production, harvesting, handling and distribution (marketing) of plant products
- The prevention and control of biotic and abiotic factors on production. Biological control of pests and diseases.
- The production and marketing of certified propagation material for crops.
- The trade of fertilizers, pesticides and other tools (machinery) and forms of agricultural inputs (farm inputs).
- The design, construction and maintenance of public and private gardens, and parks. The planting of ornamental plants, shrubs, trees, turfs and carrying out the supervision of construction of similar 'plant' projects.
- The consulting on crop production for the development or modernization of agricultural farms.
- The participation in research projects of agricultural interest.
- The participation in massive spraying with environmentally and consumer friendly media, to combat plant diseases and disinfestations or disinfections in crop production or storage facilities.
- The evaluation in all types of crop damage, spoilage and suitability of crops for use on human consumption or animals.
- The management of agricultural ecosystems and reduced input farming systems (integrated and organic farming).
- The design and implementation of applied research techniques and means of production, and the impact of the agricultural production process on the environment.
- Establishment and operation of Companies with Certified organic products or products of integrated management.
- Establishment and operation of tissue culture laboratories and marketing of these products.
- Participation in generating, cadastral, soil, vine and other related maps for agricultural use, with the cooperation of competent technical personnel.

## **B. Animal Production**

The division of Animal Production:

- a) Applies modern technological and scientific methods, as well as managerial practices, in animal production, in the processing of products of animal origin as well as the control of their quality and safety.
- b) Applies methods of hygiene in farm facilities, in the meat and milk-processing plants and applies health management programs in the farm, biosecurity programs and preventive measurements in the farm sector.
- c) Applies modern technological and scientific methods enhancing productivity and reproductive performance.
- d) Develops rationalistic methods of feeding formulation and nutrition technology from an economic and scientific perspective.
- e) Undertakes the environmental and legal problems of stock-breeding businesses and enterprises.
- f) Participates in the technological research, education and development and application of innovations in the sector of Animal Production.
- g) Innovative production of functional foods, mainly concerning goat, sheep milk, cheese and poultry and pig meat.
- h) Designs and supervises the application of agricultural-animal production studies and organizes the establishment of animal production farms.
- i) Production, marketing and trade of nutritional supplements, additives, premixes and ingredients, semen for all animal species, breeding stock as well, veterinary drugs, vaccines, disinfectants, sanitizers, health enhancements, machineries and forms of animal production tools
- j) Participates as technical staff in companion animals laboratories and private practices, animal microbiology laboratories, in feed processing plants and in the meat and milk industry, in food hygiene as well.

## **C. Floriculture and Landscape Architecture**

The division of Floriculture and Landscape Architecture practices in fields similar to the division of Crop Production as described above but furthermore relates to the productive processes of floriculture and related businesses as well as those in the field of landscape architecture and gardening (applied to rural, urban, and peri-urban green spaces). Analytically it employs:

- a) The production and handling of plants for interior spaces and potted ornamental plants.
- b) The production and handling of propagation material for ornamental plants.

- c) The production, standardization, preservation, quality certification and marketing of ornamental and flowering plants.
- d) The production, post-harvest handling and handling of cut flowers and foliage plants.
- e) The production of certified propagation material for ornamental and flowering plants.
- f) The design, construction and maintenance of “green” landscape projects, landscape reclamation, urban revitalization, natural resources and habitat management.
- g) The design, construction and maintenance of public and private gardens, “green” landscape projects and landscape reconstruction and revitalization as private free-lance professionals or employed specialized scientists in private firms.
- h) The development and conveyance of contemporary ornamental and flowering plants cultivations.
- i) Laboratory soil and plant tissue analyses in flowering plants cultivations.
- j) Advisory services rendered on irrigation and plant protection as well as technical support for establishing new flowering plants cultivations.
- k) Participation in research activities pertaining to cognitive fields offered by the department.

### **1.3 Curriculum learning outcomes**

Upon graduation the Department’s graduates:

- Will have acquired skills derived from the laboratory courses and collaborations with related businesses and their members, as they are fully aware of the connection/linkage between theoretical knowledge and practical results.
- Will be backed in their training of contemporary learning methods by means of academic scientific manuals, electronic multi-purpose and specialized scientific instruments.
- Will be able to professionally use their theoretical, applied and laboratory experiences acquired to promote both productivity and quality of services rendered, as well as intuitively solve complex problems arising in their practice.
- Will be able to collect and interpret data, formulate ethical and social judgments, promote information and ideas, resolve problems to both specialized professional and laymen alike and generate new knowledge of scientific and social breadth. They possess critical understanding of theories and principals as well as applied practical methods.
- Have developed the necessary skills and cognitive background information in order to independently pursue in great capacity further graduate studies.

## 1.4 Connecting Curriculum objectives to market needs

Undergraduate curriculum objectives are mainly based upon:

- The scientific study of the cognitive subject offered in both European and global scales
- The awareness of primary sector needs stemming from the scientific personnel's range of action and research.
- New production trends and standards that can advance Greek agricultural production into innovation and quality.
- A deeply rooted cooperation with the primary production of Epirus and Western Greece.
- Connecting/linking the department with local, national and international growers, cultivators, breeders and related businesses.
- The understanding of relating high quality education to primary sector needs in Greece and abroad.

The Department's collaborations with social and production institutions are based upon:

- Reinforcing a seminar based curriculum and education.
- «On the spot» research in agro-veterinary businesses.
- Courses offered in real world working conditions.
- Reinforcing undergraduate level research.
- Adopting "open" laboratories.
- Reinforcing "corporate" laboratories with corporate members' participation.
- Practical training in public and private institutions in Agriculture, Veterinary and Landscaping businesses.
- Knitting education, research and production into one common thread. (promoting professional versatility, cultivating basic professional student skills, developing entrepreneurship, reinforcing laboratory education in "real-life" working conditions, participating and collaborating with schools, municipalities, the agro nutritional research sector and higher education institutes of the greater rural and urban Epirus area and beyond).
- The department's contribution to local, regional and national development through innovative scientific collaborations with universities abroad and research partners from Greece concerning critical local and national products of plant and animal origins as well as landscape issues.

**Plant production:** olive groves, vineyards, aromatic and pharmaceutical plants, energy and industrial plants, biological pest control in local cultures, agricultural soil mapping, GIS, wise management of mountainous/sub-alpic meadows, containing environmental pollution through agriculture, improving quality and quality control of agricultural products and their propagation material, effects of fertilization in vegetable quality, pollen storage, biological applications of symbiotic microorganisms.

**Animal production:** animal health and welfare with a specialized focus on mammary gland and digestive system integrity and health, use of phytochemicals (aromatic plants and herbs, essential oils and clays) and nutrition additives for enhancing animal health and immunity, milk and meat quality characteristics verification through application of molecular techniques and proteomic in local Greek species of goats, sheep and fish, pork meat production with special characteristics for specific groups of consumers, (functional pork), poultry and pork production with reduced environmental footprint and energy consumption, use of proteins from Greek sources of plant species in meat production, animal proteomics and animal tissue engineering and production of biomaterials.

**Floriculture and Landscape Architecture:** hydroponic and soilless cultures, biodegradation, plant protection products, local flora species certification, seeds for cultivations, private garden design construction and management, public squares and parks design construction and management, land reclamation/rehabilitation, designing software CAD, GIS, urban green, green infrastructure, greenways, green roofs, landscape irrigation, garden illumination.

## **2. Department's Research Activity (Publication, Recognition, Awards)**

The Department of Agricultural Technology excels in national and international research boasting the following figures:

- 67 publications in accredited international journals with a total index of recognition (citations) 2.686 for the period 2008-2015.
- 178 scientific papers in peer-reviewed national and international conferences for the period 2008-2014.
- 8 book writings or translations.

Currently (2010-2015) the department is undertaking 26 research scientific programs financed by ARCHIMEDES II & III, Cooperation 2009 Large Scale, INTERREG, NEW KNOWLEDGE, Greece-China 2012-2014 Collaboration, INTERREG II, III programs, FP6, FP7, "Competitiveness & Entrepreneurship" Cooperation 2011, World Health Organization Horizon 2020, Marie Curie, transnational research programs (China, Italy, Ireland), programs funded by large scale pharmaceutical and nutritional companies, the Ministry of Development, the Epirus Region, Industrial and private Institutions, totaling 5.800.000 Euros for the last 8 years, while 45 competitive programs have been undertaken, and delivered in the last decade.

The Department has autonomously organized 22 seminars (2008-2015) and many symposiums in Arta partnering with productive institutions, municipalities, regional authorities and 22 businesses displaying a large student attendance.

In the short time since its establishment members of the academic staff have published 79 papers in peer reviewed scientific journals, they have 6 participations in book chapters and



scientific books, and 260 presentations in international conferences and full paper or abstracts in conference proceedings, also referee four scientific journals, as well as distinguished keynote conference speakers.

### 3. Postgraduate Programs

The Department of Agricultural Technology participates in the two following postgraduate programs:

- “Agro Chemistry and Animal and Plant production”

Partnership with the Chemistry Dept., University of Ioannina since 2005 (more info at <http://tegeo.teiep.gr>)

- “Aquacultures – Pathological Problems of Aquatic Breeding Organisms”

Partnership with the Veterinary Dept., University of Thessaly since 2014 (more info at <http://tegeo.teiep.gr>)

The department also cooperates with other academic institutions in the framework of professional, master and doctoral studies.

- [Erasmus IP: SUS-HORTO](#) (Advances in off-season vegetable production)
- In 2014, the Department of Agriculture Technology of the TEI of Epirus participated in the international intensive educational programme SUS-HORTO (Advances in off-season vegetable production, <http://sus-horto.com/>.) The programme is financially supported by the European programme Erasmus. The first section was implemented from 24 February to 7 March at the University of Almeria in Spain and apart from the TEI of Epirus four more Universities from Czech Republic, Italy and Spain participate.
- **E-class courses** are provided to students via the internet and the Department’s webpage. The total number of cognitive subjects that will be provided in the e-class form is further investigated.
- Social support actions for students of the Department of Agriculture Technology
- Paid participation in undergraduate on-going research might be available and paid programme for distinguished students in academic fields of the Department are regularly offered.

#### 4. STAFF

President of the department: Prof. Ioannis Skoufos, DVM, MSc., PhD.

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