



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ  
**Α.Δ.Ι.Π.**  
ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ ΠΟΙΟΤΗΤΑΣ  
ΑΝΩΤΑΤΗΣ ΕΚΠΑΙΔΕΥΣΗΣ

HELLENIC REPUBLIC

**H.Q.A.A.**

HELLENIC QUALITY ASSURANCE AGENCY  
FOR HIGHER EDUCATION

## **EXTERNAL EVALUATION REPORT**

Department of Natural Resources Management and Agricultural Engineering of the  
Agricultural University of Athens

June 2011

## **External Evaluation Committee**

The Committee responsible for the External Evaluation of the **Department of Natural Resources Management and Agricultural Engineering of the Agricultural University of Athens** consisted of the following four (4) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005 :

1. Professor Georgios H. Vatis, (Co-ordinator)  
Concordia University, Montreal, Canada
2. Professor Athanasios Alexandrou  
California State University-Fresno, California, U.S.A
3. Professor Dionysis D. Bochtis  
Aarhus University, Aarhus, Denmark
4. Professor Dimitris Xanthoulis  
Gembloux Agro-Bio Tech, Liege University, Belgium

## ***Introduction***

**The Committee for External Evaluation** (hereafter the Committee) visited the **Department of Natural Resources Management and Agricultural Engineering of the Agricultural University of Athens** (hereafter the Department) during the period 20<sup>th</sup> June– 22<sup>nd</sup> June 2011. The team arrived in the morning of the 20<sup>th</sup> and had a brief introductory meeting with Rector K. Feggeros and the departmental Self-Appraisal committee (O.M.E.A) including Dr. N. Moustakas Head of the Department. Subsequently, Dr. G. Mavrogiannopoulos made a presentation summarising the most salient aspects of the Self-Appraisal report.

On June 21 the committee met with the following groups: The departmental members of the secretariat, the Special & Laboratory Teaching Personnel (E.E.ΔΙ.Π), the Special Technical & Laboratory Personnel (E.T.E.Π), and the Long-Term Administrative Personnel (Ι.Δ.Α. Χ). In addition the Committee met with groups of undergraduate and graduate students that are presently enrolled in the programs, as well as former students that have already graduated from the department. Finally, the Committee had discussions with the members of the regular faculty (Δ.Ε.Π).

On June 22 the Committee visited various departmental laboratories, the library, the cafeteria, sport facilities, and its museum.

The Committee considered the Self-Appraisal Report, the Departmental Study Guide, and the curriculum vitae of the permanent academics. In addition, the Committee considered several documents provided by the Department.

The visit took place in an atmosphere of high level of professionalism and collegiality. We are unanimous in expressing our gratitude to all the staff of the Department for their hospitality and assistance in all aspects of the evaluation visit.

The Department belongs to **the Agricultural University of Athens** that has a long history since 1920 supporting continuously the scientific side of Greek agricultural activities. A detailed historical account can be found elsewhere, see for example the Self-Appraisal document.

Usually, every university abroad consists from a number of faculties that include several departments. The Agricultural University of Athens having no faculties is showing a divergence from the expected structure having the department heads report directly to the Rector of the University. This difference may be attributed to the manner that this University has evolved over the years.

In general, we find the department to be in a relatively healthy condition having a curriculum with a good balance between theory and experiment. Highly qualified personnel that also conduct research, which is disseminated in peer-reviewed journals of high repute, teach the courses. There is ample evidence suggesting that its graduates are well placed within as well as outside Greece. Consequently, the recommendations to follow are our attempt to assist a good department in developing a long term vision that hopefully will help their quest for

excellence, as presently defined internationally.

As an overall recommendation, the Department should find a clear novel identity, mission, and operational niches compatible with: the capabilities and technical competencies of its staff, the needs of the agriculture and food industries, consumer requirements, international trends in all relevant aspects of higher education, learning from the experiences of its former graduates, the opinions of industry and related socio-economic stakeholders. The Committee considers this to be a difficult task, but essential in the drafting of an effective future strategic plan that will propel the department forward.

Also it is imperative that in order to operate harmoniously within the frame of the European sister institutions and add value to the academic operations, the program should standardize its activities according to Bologna Process as it has been originally signed by the minister of education. The Committee considers this as great asset for the Department's graduates.

The present report is structured according to the template headings required by HQAA. In each section there is analysis of the current situation and recommendations by the Committee.

## ***A. Curriculum***

Required courses are 61 (of 72 provided), 62 (of 77 provided), and 59 (of 67 provided) for the Division of Agricultural Construction and Agricultural Engineering, the Division of Water Resources Management, and the Division of Soil Science and Agricultural Chemistry, respectively. This number of courses leads to a Bachelor degree of around 300 ECTS.

Under the current curriculum, undergraduates are required to take 31 core courses (including 4 foreign language courses) that are provided within the first 4 semesters of the 5-year Bachelor's degree.

The Department has 28 faculty members that provide around 40 courses. In detail, 44 (61%) courses in the Division of Agricultural Construction and Agricultural Engineering, 41 (54%) courses in the Division of Water Resources Management, and 36 (61%) in the Division of Soil Science and Agricultural Chemistry. The rest of the courses are provided by the other departments of the University.

Students at the Masters level are required to take 8 courses, to be completed in 3 semesters and this is closely monitored. Ph.D. programs are entirely research-based.

According to the Committee a weakness in the Curriculum is that the contents of courses are rather diverse, a fact that is partially explained by the multidisciplinary nature of the Department, but on the other hand, courses are not clearly interconnected and possess a high degree of overlap. Furthermore, the Committee found significant variability in the quality of the course materials with appropriate ones coexisting with outdated.

The system allows a student to carry a fundamental core course "indefinitely" over the years, without having passed it since prerequisites are not required. This system is of course, highly undesirable allowing students to take "specialised" courses without the proper fundamental

knowledge. The last along with other factors leads to a prolong time to graduate (currently around to 7-8 years).

To this end, the following are recommended:

**Recommendation A1:** In its new identity the Department has to seriously investigate and consider the adoption of European and International trends in the field making the appropriate adjustments to its curriculum according to generally accepted educational programmes, as these are articulated by the relevant associations and official thematic networks.

**Recommendation A2:** Minimisation of thematic overlaps in courses is imperative.

**Recommendation A3:** Enforce the balance between basic science, engineering, environmental, and agricultural courses in the core of the curriculum.

**Recommendation A4:** The committee recommends that the department has to introduce a policy which will provide a detailed syllabus for each course and clearly articulate applicable policies, learning outcomes and expectations, assessment schedule, grading system, office hours and contact details for faculty.

**Recommendation A5:** Modernise the names of the courses by the adoption of internationally accepted keywords in related sciences (such as environmental management, natural resource management, de-pollution, integrated water resource management, environmental assessment, remediation)

**Recommendation A6:** When the Department crystallises on an appropriate mission it is recommended that the new curriculum contains a strong core supported by focus specialization courses.

**Recommendation A7:** Since it appears that the Department has successful research achievements in areas of high demand such as water resources management, automation systems, environmental management, environmental engineering, bio-processes, bio-materials, bio-energy, etc., course material should reflect this strength.

## ***B. Teaching***

According to the departmental Self-Appraisal report the objective of the studies is the sustainable management of natural resources and environment, and the development of technology in the related areas.

### *Teaching methods used*

Teaching methods include classroom teaching, power-point presentations, laboratory exercises and opportunities to engage in laboratory research, and fieldtrips in selected courses.

### *Teaching staff/ student ratio*

The faculty member/student ratio for the Department is 1/8.1. It should be noted that the

majority of the courses contain a laboratory component. The committee appreciates the fact that the student groups are of relative small size. Some laboratory sessions use specialised personnel to teach the labs. Students expressed their satisfaction with the quality of the instruction in the labs.

#### *Teacher/student collaboration*

It was evident from discussions with a number of postgraduate and undergraduate students that teaching staff is largely accessible, particularly true for postgraduate students.

#### *Adequacy of means and resources*

Undergraduate students voiced their satisfaction with the classroom assignment policy. They also stated that for most cases laboratory consumables were in adequate quantities. Furthermore, they mentioned that in most laboratories the equipments although well maintained, were outdated. Faculty recognised the existence of the problem and attributed the cause to the absence of funds to maintain existed and/or purchase updated equipment.

Students have adequate access to major libraries and databases through internet. The University library is located in the main campus and provides reference material, an adequate reading room and computers.

#### *Use of information technologies*

Students and faculty have been issued university e-mail addresses. All buildings of the Department are equipped with internet connections.

#### *Examination system*

The quality and effectiveness of the teaching is evaluated mostly by a single final examination which is almost exclusively written although an oral exam may be used mostly for the laboratory part of the course. The Department uses the 10 grade scale and the student has to have at least 5 to pass the course. Data indicate that most students pass the courses with a grade between 6 and 8.4.

The Committee notes that during the last five years the number of student that graduated with a grade higher than 8.5 is rather low.

#### *Quality of teaching procedures*

Most faculty members are dedicated and enthusiastic about their teaching and as a result, the quality of teaching is high.

Attendance of courses is rather low. Students do not attend all courses and current legislation does not allow for the instructor to introduce compulsory attendance.

#### *Quality and adequacy of teaching materials and resources*

During interviews with students it became apparent that some of the notes provided to the students are outdated.

#### *Mobility of academic staff and students*

Faculty members accumulate sabbatical time, which they can use for their scientific advancement according to a personal plan that fits their needs. Faculty members are encouraged by the Department to use their sabbatical leave to carry out research in other

institutions.

During interviews with students the committee asked about their experience with mobility programs such as Erasmus exchange program. Participants in the interviews stated that there were few students making use of Erasmus justifying it to the difficulty of transferring credits from the courses that they may take and pass abroad.

*Evaluation by the students of (a) the teaching and (b) the course content and study material/resources*

The O.M.E.A. provided student evaluation of instruction for courses taught in the Department. The questionnaire is considered appropriate and included questions on teaching, course content and material used. Student evaluation of instruction was used in subsequent semesters in every course.

Committee acknowledges the fact that the course evaluation process is in its infancy.

**Recommendation B1:** The Department is advised to study the use of software web-teaching packages.

**Recommendation B2:** The introduction of weighted grading where the student grade will depend on midterm exams, quizzes (announced and unannounced), assignments, laboratory exercises and a final exam may provide an incentive for students to attend the classes.

**Recommendation B3:** Faculty should address this issue of updated course material.

**Recommendation B4:** The Committee suggests that the Department should abide with the institutional and Erasmus policies.

**Recommendation B5:** Regular evaluation could lead to improvement of teaching and the upgrade of the faculty's teaching skills and its continuous use in all semesters and courses in a mandatory manner is strongly encouraged by the Committee.

**Recommendation B6:** Currently there is no established process on assessing efficacy of teaching. An outcomes assessment process with metrics should be gradually introduced. The assessment should be referred to individual courses and examine if at the end of the course the student has achieved the learning outcomes.

## ***C. Research***

The comments that follow are made having as a benchmark a research-intensive institution. The research activities, as compared to the acceptable international standards, are mainly undertaken by academics, either on a voluntary basis or as a means to advance through the academic ranks.

Compared to international standards, the Committee finds that the overall research activities need upgrading. However, there exist some pockets of excellence with high potential that may lead to significant contributions in the fields of agriculture and environmental engineering, in the near to medium term future.

The Committee noticed the wideness of fields of interest. However, the committee finds (to a large extent) that these activities cover a very wide range of fields of interest that may dilute research efforts and perhaps cause financial burden. The last is of particular importance in view of the recent financial situation of the country. We strongly encourage the department to seek increase funding from EU sources.

The committee is impressed with the establishment of a spinoff company, the recent successful EU-FP7 grant, and the number of obtained and pending patents.

In general, the average publication output of tenured faculty members is less than 1 peer-reviewed journal publication per year per faculty member. It has been noticed that this average output is the result of a highly diverse individual staff performance, with some faculty members far exceeding the above mentioned figure while others having a negligible contribution to the publication output. However, the Committee also notes that the research results have been disseminated in journals of high regard.

Many researchers expressed concerns about shortage of equipments used in analysis. Although this might be true at the local level, the committee notes that this may not be a true shortage globally, since the required equipment may exist in another laboratory or department.

**Recommendation C1:** The Committee suggest that the Department concentrates its activities in targeted areas in the fields of high demand especial those linked to climate changes. This concentration may result into findings that will catapult the department into excellence and become the leader in the field.

**Recommendation C2:** The Committee urges researchers while maintaining the present high quality of research to also increase the average rate of peer-review publications. The latter pertains to faculty members that fall well below 1 peer-reviewed journal publication per year.

**Recommendation C3:** The shortage in experimental equipment (e.g. devices used in analysis) can be partially addressed by divisions/other departments sharing existing resources.

## ***D. All Other Services***

Adequate administrative infrastructure is in place. The Department has access to web support, and computer stations are available to students at the library. Computer stations at the central library are numerous and up-to-date.

Certain laboratory programs offer services dedicated to specific deliverables of significance to the University. The Committee would like to comment Geomations, a spinoff company of AUA, which targets to use technologies developed in the University and adapt them to the real world in the area of agricultural automation.

The Committee noticed that the Department has access to the University's support services and provides services for the students with learning or physical disabilities. Athletic facilities

are considered above average.

Based on the information provided in the internal Self-Appraisal, discussions with faculty members and students, and actual visits to the Department and related facilities, the Committee considers the functionality of the Department's administrative services and infrastructure effective.

Students appear to be reluctant to utilize elected student representative bodies in order to voice their grievances regarding academic issues.

Job placement services for students are limited. Organized meetings with representatives from the agricultural sector, industry, government, institutes, foundations etc. would assist students in networking with potential employers; faculty engagement in assisting students with choices for the performance of the Practical Exercise and with internship opportunities will continue to be crucial.

**Recommendation D1:** The Committee recommends the development of an organized mentoring system for junior faculty on issues related to professional growth and development, teaching and scholarly activity.

**Recommendation D2:** The Committee recommends the development of a retention, promotion and tenure institutional policy which will provide guidance to faculty members on related issues.

### ***E. Strategic Planning, Perspectives for Improvement and Dealing with Potential Inhibiting Factors***

As an overall recommendation of paramount importance we propose that:

**Recommendation E1:** The Department should define a clear novel identity, mission, and operational niches compatible with: the capabilities and technical competencies of its staff, the needs of the agriculture and food industries, consumer requirements, international trends in all relevant aspects of higher education, learning from the experiences of its former graduates, the opinions of industry and related socio-economic stakeholders.

Having achieved the above, the Department is encouraged to develop a long term vision with main aims:

- a) To carry out a thorough planning of the curriculum to truly reflect the core aims and objectives.
- b) To develop a research strategy that will include specific methods and procedures for the identification, fostering and development of research topics within the Department and the support and encouragement of academic staff to get engaged in research programmes and to develop their skills.

**Recommendation E2:** The committee considers the existing extensive inbreeding as an

inhibiting factor and recommends a seeking of qualified outside candidates positions.

## ***F. Final Conclusions and recommendations of the EEC***

The most important conclusions reached by the Committee are assembled here. The detailed recommendations in each area that can be found at the end of the corresponding Sections, numbered accordingly, are not repeated here.

### **General**

The Department should develop a novel identity and long term mission. In so doing, areas of global importance such as the environmental impact of relevant activities must be taken into account using modern engineering advances.

### **Curriculum**

In its new identity the Department has to consider generally accepted educational programmes, as these are articulated by the relevant associations and official thematic networks. In addition, it should minimise thematic overlaps in courses and enforce a good balance between basic science, engineering, environmental, and agricultural courses. Furthermore, the committee recommends that the department has to introduce a compulsory policy with respect to a detailed syllabus and put limitations in the transfer of prerequisite courses.

### **Teaching**

In order to facilitate the mobility of students and faculty the Committee sees it as imperative that the Department abides with the Bologna Process. In addition, it should establish processes to assess the efficacy of teaching.

### **Research**

The Department should concentrate its activities in targeted areas of demand that can catapult the program into excellence, while maintaining the present high quality of research.

### **Planning**

Having achieved all of the above, the Department should develop a long term vision with main aims to carry out a thorough planning of the curriculum to truly reflect the core aims and objectives, and draft a research strategy that will include specific methods and procedures for the identification, fostering and development of research topics within the Department.

The Members of the Committee

Name and Surname

Signature

1. Professor Georgios H. Vatistas, (Co-ordinator)
2. Professor Dionysis D. Bochtis
3. Professor Athanasios Alexandrou
4. Professor Dimitris Xanthoulis