ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

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ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ ΚΑΙ
ΠΙΣΤΟΠΟΙΗΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ
ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC

H.Q.A.

HELLENIC QUALITY ASSURANCE AND
ACCREDITATION AGENCY

EXTERNAL EVALUATION REPORT

Department of Digital Systems

University of the Piraeus

October 2013

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External Evaluation Committee

The Committee responsible for the External Evaluation of the **Department of Digital Systems of the University of the Piraeus** consisted of the following four (4) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005:

1. **Prof. Anthony Ephremides,** University of Maryland, Maryland, U.S.A., **Coordinator**

2. **Prof. Marios Kountouris,** École Supérieure d'Électricité (SUPELEC), Gif-sur-Yvette, Paris, France

3. **Prof. Constantinos S. Pattichis,** University of Cyprus, Nicosia, Cyprus

4. **Dr. Lampros Stergioulas,** Reader, Brunel University, Uxbridge, United Kingdom

N.B. The structure of the "Template" proposed for the External Evaluation Report mirrors the requirements of Law 3374/2005 and corresponds overall to the structure of the Internal Evaluation Report submitted by the Department.

The length of text in each box is free. Questions included in each box are not exclusive nor should they always be answered separately; they are meant to provide a general outline of matters that should be addressed by the Committee when formulating its comments.

Introduction

I. The External Evaluation Procedure

The external committee, consisting of :

1. Prof. Anthony Ephremides, University of Maryland, Maryland, U.S.A., Coordinator

2. Prof. Marios Kountouris, École Supérieure d'Électricité (SUPELEC), Gif-sur-Yvette, Paris, France

3. Prof. Constantinos S. Pattichis, University of Cyprus, Nicosia, Cyprus

4. Dr. Lampros Stergioulas, Reader, Brunel University, Uxbridge, United Kingdom

visited the Department on Monday Oct 7th, Tuesday Oct 8th, and Wednesday Oct 9th, 2013. During the visit formal presentations were given by Department faculty mostly on the undergraduate and graduate teaching on Monday, and mostly on the research activities of the labs, visits to the labs, and other departmental activities on Tuesday. The committee had also the chance to speak to individual faculty members as well as representatives of students technical support staff and administrative staff members. Finally, the committee saw the labs and other Department infrastructure facilities. Individual members of the committee spoke with individual members of the staff in their offices, in private. They also spoke with alumni, representatives of the graduate students and PhD candidates, and post-doctoral fellows. The committee considers that all these formal and informal contacts allowed it to make a formal assessment of the status of the Department and to obtain a solid understanding of their problems, their strengths and their weaknesses as well as their aspirations.

In addition, the Department had made available to the committee, a large volume of data, including samples of final year project reports, doctoral theses, CVs of faculty members, statistics of student performance, student status, admission and graduation numbers, extensive reports of various kinds, as well as plans for curriculum improvement currently under discussion. In particular, the following documents were made available to the committee:

➢ Internal Evaluation of the Department for 2007-2011

➢ Samples of final year projects and M.Sc. theses

➢ Samples of PhD theses

➢ Samples of past exam papers

➢ Copies of slides of all presentations made

➢ Copy of an earlier Strategic Plan of the Department (2008-2012).

II. The Internal Evaluation Procedure

The committee felt that all resources made available to them were very helpful and informative. The process of the internal evaluation was clearly explained and was adequate and complete and involved participation of all the units of the Department, and the Final Internal Evaluation Report was consistent with the H.Q.A.A. template and guidelines.

A. Curriculum *Undergraduate Programme*
To be filled separately for each undergraduate, graduate and doctoral programme.

APPROACH - *Undergraduate Programme*

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*

The goal is to offer the students broad training in the development, implementation, and administration of information and communication technology (ICT) systems, in order to prepare them for the needs of the digital economy, and the society of knowledge. In this context, the curriculum covers the areas of net-centric systems and services, and telecommunication systems and services.

The undergraduate programme covers the subject areas of e-Services (e-S) and Communication Systems and Networks (CSN).

The curriculum consists of three parts, namely: the required (mandatory) courses (35 of them, including a final year project that counts as two courses), additional specific subject area required courses (8 courses per subject area), and additional subject area elective courses (42 courses in the subject area of e-S, and 37 courses in the subject area of CSN, with 26 of these being common to both subject areas).

These courses are distributed among the following 6 labs of the Department: Net-Centric Digital Systems & Services, Digital Health Services, Telecommunication Networks & Integrated Services, Digital Systems Security, Telecommunication Systems, and Technology-Enhanced Learning.

All the Laboratories of the Department have endured the ravages of the unacceptable bureaucratic control that the Ministry of Education exercises over the Universities in Greece. Specifically, the Department submitted its proposals with a request for zero budget support from the State since it is entirely self-supported. After a significant waiting period the response was that they need to request a non-zero financial support. So, the proposal was resubmitted with a request for small amounts of funding. Again after considerable delay the response was that there were no funds to support the Laboratories. The proposals have been resubmitted and the respective approvals are still pending.

- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the Department, including students and other stakeholders, consulted?*

The objectives of the curriculum were decided based on the desire to offer a unique and competitive programme in Greece at the intersection of Information and Communication Technologies. The core curriculum includes basic benchmarks of Informatics and Communication Systems and it takes into account the diverse expertise of the faculty. In the current version of the programme, the guidelines of the American Computing Machinery (ACM) association and of the Institute of Electrical and Electronic Engineering (IEEE) are followed.

- *Has the unit set a procedure for the revision of the curriculum?*

The Department through its Internal Evaluation Committee is reviewing the curriculum on a

regular annual basis so as to revise and modify it as needed.

IMPLEMENTATION - *Undergraduate Programme*

- *How effectively is the Department's goal implemented by the curriculum?*

The curriculum is implemented quite effectively through its structure along the lines of the two main tracks of the programme.

The curriculum is ambitious and broad with a large number of courses, which most students find difficult to complete within the nominal duration of 4 years (the average duration of the completion time is approximately 6.8 years). The new requirements of the law mandate a 6-year maximum duration.

The structure of the curriculum is realistic and includes recommended tracks with a logical sequence. However, there are no required prerequisite structures. As a result, there can be adverse outcomes for some students who choose not to follow the recommended sequences.

- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*

The implementation of the curriculum satisfies the requirements of the European Credit Transfer system (ECTS).
A stricter adherence to a pre-requisite-based structure would be beneficial.

- *Is the structure of the curriculum rational and clearly articulated?*

The structure of the curriculum is clear, the choice of core courses is sensible, and, overall, it provides the necessary background to the students. The rich choice of elective subject area courses enhances the effectiveness of the curriculum.

- *Is the curriculum coherent and functional?*

The curriculum is well thought-out, coherent, and functional.

- *Is the material for each course appropriate and the time offered sufficient?*

The course content is sufficient and appropriate but in some cases overly ambitious.

- *Does the Department have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*

The Department does have the appropriate resources, at least at the lecture level, to implement the curriculum. The faculty instructors are highly qualified and trained. However, the Department lacks University-funded supporting personnel like trained staff and teaching assistants (for lab teaching, and homework grading). Furthermore, the Department faces serious space limitations (especially for the labs).

RESULTS - *Undergraduate Programme*
- *How well is the implementation achieving the Department's predefined goals and objectives?*
- *Does the Department understand why and how it achieved or failed to achieve these results?*

The current implementation provides very satisfactory results in achieving the Department's predefined goals and objectives, since it manages to place its graduates in the job market

very successfully despite the sometimes medium level of student achievement prior to, and shortly after, admission.

IMPROVEMENT - *Undergraduate Programme*

- *Does the Department know how the Curriculum should be improved?*
- *Which improvements does the Department plan to introduce?*

The Internal Evaluation Committee is functioning effectively in monitoring the ICT state-of-the-art and in making the improvements needed to the curriculum, which covers a wide area of subjects. However, its structure should be revisited to achieve a better balance between breadth and depth. The inclusion of a course on entrepreneurship would enhance the programme and would be consistent with desires expressed by some students.

A. Curriculum – *Graduate and Doctoral Programmes*
To be filled separately for each undergraduate, graduate and doctoral programme.

The Department offers a Graduate Programme in:

(i) Technology Education and Digital Systems, leading to a Master's Degree (M.Sc.) of 90 ECTSs in one of following areas of study:
- e-Learning
- Net-Centric Systems
- Digital Communications and Networks.

(ii) Techno-economic Management and Digital Systems Security, leading to a Master's Degree (M.Sc.) of 90 ECTSs in one of the following areas of study:
- Techno-economic Management
- Digital Systems Security.

The PhD programme is research-based and leads to a doctoral degree in the following main areas:
- Net-Centric Systems and Services
- Digital Health Services
- Telecommunication Networks and Integrated Services
- Digital Systems Security
- Intelligent Systems and Multimedia Technologies
- Telecommunication Systems
- Technology-Enhanced Learning.

Note: The title of the first component of the Graduate Programme (Technology Education) does not exactly match the content of that component and does not exactly correspond to the term the Department uses in Greek (Διδακτικη της Τεχνολογιας). In addition, this term is somewhat ambiguous.

APPROACH - Graduate (M.Sc. and PhD) Programmes

- What are the goals and objectives of the Curriculum? What is the plan for achieving them?

The goals and objectives of the graduate (M.Sc. and PhD) programmes include

(i)   furthering the education of students beyond the B.Sc. 4-year programme

(ii)   enhancing their career opportunities in today's dynamic market in ICT

(iii)   producing high-quality research that is supported by competitively obtained funding, and preparing qualified researchers to fill advanced positions in Industry and Academia at a national and international level.

The implementation plan entails core courses, courses in five (5) subject areas, a mandatory M.Sc. thesis, cross-disciplinary options, and a doctoral dissertation for the doctoral programme.

A departmental committee (for each graduate degree programme) evaluates the applicants' qualification for admission based on well-defined criteria.

- How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?

The objectives were carefully decided to conform with:

(i)   international benchmarks of the ACM and the IEEE;

(ii)   the faculty expertise and strengths of the Department in its effort to find a niche securing a competitive edge in the plethora of graduate programmes in Greece, and the dynamically evolving needs of the ICT market.

- Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?

Clearly, the objectives of the graduate curriculum are in par with international benchmarks, the needs of Society, and the rules and regulations imposed by the Ministry of Education.

- How was the curriculum decided? Were all constituents of the Department, including students and other stakeholders, consulted?

The External Evaluation Committee was not able to assess how the curriculum was constructed and whether students or other stakeholders were consulted.

- Has the unit set a procedure for the revision of the curriculum?

As is the case of undergraduate studies, the Department, through its Internal Evaluation Committee evaluates the programme on an annual basis for the purpose of revising the curriculum as needed.

IMPLEMENTATION - *Graduate (M.Sc. and Ph.D.) Programmes*
- *How effectively is the Department's goal implemented by the curriculum?*

Based on broadly-accepted metrics (quantity and quality of publications as well as standard citation indices), the effectiveness of the graduate programme in research and in raising external funding support is deemed excellent.

- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*

Despite the relatively recent establishment of this Department (established in 1999, offered the first M.Sc. programme in 2004, and the first PhD programme in 2003), its graduate programme compares favourably with peer programmes worldwide.

- *Is the structure of the curriculum rational and clearly articulated? Coherent? Functional? Is the material for each course appropriate and the time offered sufficient?*

The structure of the graduate curriculum is certainly rational, coherent, functional, and clearly articulated. The per-course material content is appropriate.

- *Does the Department have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*

The available resources are marginally adequate given the number of students, the magnitude of the teaching load, the additional research and funding activities, as well as the popularity of the subject areas, which is only expected to grow in the future. Increasing the number of government-funded teaching assistants is a must, in view of the fact that this graduate curriculum can truly benefit from additional laboratories and design projects.

RESULTS - *Graduate (M.Sc. and Ph.D.) Programmes*

- *How well is the implementation achieving the Department's predefined goals and objectives?*

- *Does the Department understand why and how it achieved or failed to achieve these results?*

The graduate programme implementation is regularly evaluated through annual progress reports that review the level of external funding to support graduate students, the research productivity per faculty member (in terms of highly reputable journal publications and conference paper presentations at high-quality venues), and the number of PhD students per faculty member (which cannot exceed 5).

IMPROVEMENT - *Graduate (M.Sc. and Ph.D.) Programmes*

- Does the Department know how the Curriculum should be improved?

As is the case with the undergraduate programme, the Internal Evaluation Committee is functioning effectively in monitoring the ICT state of- the- art technologies and in making the improvements needed to the curriculum.

- *Which improvements does the Department plan to introduce?*

The proposed ideas for improving the graduate curriculum include:

(i)   expansion of collaboration with industry and other external organizations and obtaining feedback from them

(ii)   enhancing the availability of open source software systems developed via M.Sc. and PhD theses and considering the offering of MOOC (Massive Open On-line Courses)

(iii)   expanding the seminar programme with external experts

(iv)   consideration of student awards for best M.Sc. thesis per subject area;

(v)   expansion of mobility and industrial placement of students in companies internationally via the EU Framework Programmes

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B. Teaching

APPROACH:

Does the Department have a defined pedagogic policy with regard to teaching approach and methodology?

Please comment on :
- *Teaching methods used*
- *Teaching staff/ student ratio*
- *Teacher/student collaboration*
- *Adequacy of means and resources*
- *Use of information technologies*
- *Examination system*

The teaching methods used by the Department include traditional academic lectures and modern web-based learning tools. The Department website enables the students to look up online lecture notes, upload assignments, contact the teacher and receive feedback. The vast majority (95%) of undergraduate courses has a single section while 5% has multiple sections. In addition to the 50 mandatory undergraduate courses (35 core + elective courses), a series of seminars given by prominent researchers are offered to the students. The attendance at the Master's level is mandatory and classes take place in the evening to minimize disruption of students' work commitments.

The teaching staff-to-student ratio is rather on the high end; no matter how it is calculated. The heavy teaching load imposed by the law reaches 13.5 hours per week on average (10h at undergraduate level and 3.5 at graduate level). Nevertheless, the External Evaluation Committee observed a positive attitude on the part of teacher-student interaction and collaboration. Some undergraduate students are welcome to join the Research Labs and several of them, after graduation, enrol in the Department's graduate programme.

The means and the resources assisting the teaching process are considered inadequate. A high student-to-teacher ratio in conjunction with underequipped labs and the shortage of space has caused perturbations in the efficient running of the lab sessions.

The Department makes heavy use of information technologies for teaching and some of the platforms have been developed in house. All undergraduate and graduate courses are available online through the Department website and the e-learning, e-class platform EVDOXOS, in which recommended textbooks and lecture handouts are posted.

The examination system is a traditional one with written exams offered twice a year and some courses have a lab component and/or exercise assignments. Student projects are part of the majority of undergraduate and Master's elective courses. The inclusion of student collaborative projects on entrepreneurship would be an asset to the teaching programme and would be consistent with desires expressed by some students.

The well-established standard of prerequisite courses is not applied. Adherence to this practice, which has the obvious advantage of streamlining the different flows of courses, would be beneficial, despite being very uncommon in Greek universities and encountering fierce objection by the students.

IMPLEMENTATION

Please comment on:
- *Quality of teaching procedures*
- *Quality and adequacy of teaching materials and resources.*
- *Quality of course material. Is it brought up to date?*
- *Linking of research with teaching*
- *Mobility of academic staff and students*
- *Evaluation by the students of (a) the teaching and (b) the course content and study material/resources*

An internal departmental Committee assesses and reviews the teaching quality and the effectiveness of teaching material and resources on a regular annual basis. Nevertheless, the review process is constrained by the limited or non-existing degrees of freedom for curriculum revision imposed by the law. It is interesting to note that one of the weaknesses of the State control manifests itself in the requirement that one book per student per

undergraduate course is provide gratis while in some courses more than a single book is required.

The final year undergraduate projects are associated with the research interests of the faculty members. Students benefit from the high research quality of the Department and the link between research and teaching. Master's level research is sometimes linked with projects pursued in collaboration with Industry. This has the advantage of providing the students with hands-on experience.

There is no articulated policy in the Department related to the mobility of faculty members. However, several researchers (professors, PhD Students and postdoctoral fellows) are involved in international research projects and have the opportunity to be in regular contact and collaboration with institutions and companies abroad.

Through the Erasmus Programme, students have the opportunity to study and even pursue their diploma/Master thesis in one of the partner European Universities. The mobility of students is exceptional but the flow of incoming-outgoing students is asymmetric. The reason for that is the Greek law restriction which requires that all instruction be in Greek. This discourages foreign students from studying in Greek Universities.

There are the usual paper-based questionnaires for student feedback at the undergraduate level, whereas for graduate course evaluation the Department has implemented an online anonymous system.

RESULTS

Please comment on:
- *Efficacy of teaching.*
- *Discrepancies in the success/failure percentage between courses and how they are justified.*
- *Differences between students in (a) the time to graduation, and (b) final degree grades.*
- *Whether the Department understands the reasons of such positive or negative results?*

According to the Internal Evaluation Committee, the successful pass rate is not uniform among courses. Due to time constraints, the External Evaluation Committee did not examine this issue in detail. It does merit however more attention by the Department. There are discrepancies in participation and successful pass rate for undergraduate and graduate courses, which are caused by the entrance exam system. Proving full control of the admission process to the Department may cure these discrepancies and improve the effectiveness of the teaching and learning process.

The average duration of degree completion time is 6.8 years for undergraduate studies and 3.8 years for the Master's programme. The Department, like most Greek universities, suffers from the phenomenon of, so called, "eternal students". Specifically, 819 currently enrolled undergraduate students entered the programme more than 4 years ago. The average GPA is not sufficiently high (ranging between 6.59 and 6.76 on a scale 0-10). There is a variety of reasons for the above issues, including background and work commitments of the students. The new legal framework which requires that a student must graduate no later than 2 years after the nominal duration of the programme (known as the (n+2) system) is likely to improve the above metrics.

IMPROVEMENT
- *Does the Department propose methods and ways for improvement?*
- *What initiatives does it take in this direction?*

The Department has established an internal process for assessing and reviewing the teaching quality and the fulfilment of the pedagogic objectives. The course materials at both undergraduate and graduate levels are evaluated on an annual basis and the Department is taking corrective and preventive actions as needed.

The Department does not have any control on the number of incoming students, which is mandated by the State, nor does it have control of the Entrance Exam. These limitations, combined with the lack of resources, are a serious hindrance to the effectiveness of the teaching programme of the Department.

C. Research

For each particular matter, please distinguish between under- and post-graduate level, if necessary.

APPROACH

- What is the Department's policy and main objective in research?
- Has the Department set internal standards for assessing research?

A Department-wide research policy is not in place. However, a number of well-articulated goals and strategies that each of the Research Labs is employing allows the necessary flexibility and adaptability for the inclusion of emerging topics in the Research Programme.

It seems that the main objective of the Research Lab teams is to sustain their status as world-class research units and to exploit special niches in their subject areas. We observed that both the established core research areas, such as infrastructure, telecommunications, networks etc., and the selected niche application areas, such as e-learning, security, and health, are well covered, and the Department as a whole pursues a unique mix of research activities and is particularly dynamic and agile in maintaining a leading national and international role across the board. It is commendable that the departmental Research Labs have achieved excellence, both in the established/core areas and in the selected emerging niche areas, both within Greece and internationally.

We find it unacceptable and really outrageous that government approvals for the internationally recognized and highly successful Laboratories of the Department are still pending, although the application for approval was submitted years ago, as described in the Curriculum section of our Report. This is clearly a case where the mechanism of State control creates unacceptable delays and raises obstacles thereby hindering progress in the research and academic processes.

The Department's research activities are distributed in terms of the six Research Labs that are currently in operation:

- Net-Centric Systems & Services
- Digital Health Services
- Telecommunication Networks & Integrated Services
- Digital Systems Security
- Telecommunication Systems
- Technology-Enhanced Learning

The Department might benefit from some re-aligning and repackaging of the research portfolio to reflect a crisper hierarchical structure of the subject areas, in terms of the Research Lab grouping which is already naturally in place, so that it represents a more cohesive and interconnected whole, rather than a horizontal/linear listing of isolated research areas. Such structure could serve well the research diversity in the Department, which is healthy and beneficial, while facilitating strategy development, and enabling the adaptation, evolution, and expansion of the research agenda towards emerging research topics, thus allowing the groups to remain at the cutting edge of their respective areas. Thus such realigning would do more justice to their overall excellent research work, and allow more effective presentation and communication of their achievements. On that note, the Committee observed an inadequate and unclear description of the otherwise admirable and substantial funding picture. The presentation did not display as prominently and clearly as it

should the details and exact amounts of the support obtained by the externally funded projects.

Research quality standards seem to be indirectly set and observed mainly through the PhD programme, which explicitly requires two journal publications and one conference publication for the successful completion of the PhD degree. Similar standards seem to apply across the board at the faculty level for their research work. Furthermore, internally, there seems to be a mutual awareness and recognition among the faculty of each other's work. There is a good collaborative atmosphere and esprit de corps among faculty and students. There is a satisfactory process in place for the assessment of the research achievements, and promotions procedures are clear, fair, and appropriate and based on merit, and have been applied without problems over the years.

IMPLEMENTATION
- How does the Department promote and support research?
- Quality and adequacy of research infrastructure and support.
- Scientific publications.
- Research projects.
- Research collaborations.

The Department as a whole places high emphasis and priority on delivering world-class research. This is done mainly through the 6 established Research Labs, by leveraging their significant international links and collaborations and by the supportive work of the doctoral students and postdoctoral fellows. This commendable attitude and effort compensates for the inadequate research infrastructure.

The research project grants awarded to the Department are substantial and from highly competitive calls.

A remarkable and noteworthy (perhaps quite unusual, if not unique for Greece) element of activity as a result of the research programs in the Department was the fact that at least one start-up company was created by recent graduates of the Department with successful operations within the marketplace in Greece.

RESULTS
- How successfully were the Department's research objectives implemented?
- Scientific publications.
- Research projects.
- Research collaborations.
- Efficacy of research work. Applied results. Patents etc.
- Is the Department's research acknowledged and visible outside the Department? Rewards and awards.

Although research support in terms of administrative aspects of proposal preparation and project management/implementation is almost non-existent, the performance is impressive and comparable to that of leading universities in the world. The results of the research have had significant impact, as evidenced by the output of publications, quality of journals, number of competitions won by students, and a significant number of national and international awards received by the faculty.

The fledgling international patent activity in the Department is commendable despite the fact that the academic culture in Greece is not conducive to patent filing, and that IPR issues are different than those in other countries. However, we would encourage the Department to strengthen their efforts in this area towards more and better exploitation of results and thus increase the impact of, and benefit from, the research output.

It is also noteworthy that the graduate program at the master's level is fully self-supporting and relies on tuition income. This is a healthy development for the higher education environment in Greece, as it follows international practices and standards and registers successful outcomes as a result (like the entrepreneurial activity of its graduates, mentioned earlier).

IMPROVEMENT
- Improvements in research proposed by the Department, if necessary.
- Initiatives in this direction undertaken by the Department.

The existing research policies within the Research Labs can be integrated into a Department-level strategy and incorporated into the Strategic Plan of the Department.

A research policy should be developed and explicitly articulated in terms of a short-to medium- term Strategic Plan that would include a crisper reflection of the research activities.

Overall workload is exceptionally heavy, thus negatively impacting the research performance and output. Some balance and consolidation of the curriculum would be desirable, and might allow the staff to dedicate more time to their research activities, but given the legal constraints, a better balancing of the teaching and research workloads may not be feasible.

Lack of resources to provide sufficient support for research development, grant proposals and project administration/management has substantial negative impact, and a solution to this problem is urgently needed.

Conclusion: It is highly commendable that, despite all the difficulties and limitations, which are primarily due to the tight State control and the lack of funding and resources, the Department has succeeded to establish a high quality research programme and excellence across the board of its core/established areas as well as emerging niche areas.

D. All Other Services
For each particular matter, please distinguish between under- and post-graduate level, if necessary.

APPROACH
- *How does the Department view the various services provided to the members of the academic community (teaching staff, students).*
- *Does the Department have a policy to simplify administrative procedures? Are most procedures processed electronically?*
- *Does the Department have a policy to increase student presence on Campus?*

The Department offers a variety of additional services to the members of its community and beyond. To the students it offers academic and research/professional advice and guidance, to the faculty collegial support for professional development, and to some of the administrative staff it provides support from externally funded projects. Furthermore, it provides extensive technical services to organizations in the broader community and even instruction services to students from other departments within the University.

The Department strives to simplify the administrative overhead confronting its functions but its efforts are often hindered by the plethora of State-imposed requirements and constraints. It makes heavy use of electronic procedures and engages the students with incentives to maximize their presence on the Campus (e.g. by providing a departmental library in one of the laboratories that does not lend out its books but permits free access and ample use on the premises).

IMPLEMENTATION
- *Organization and infrastructure of the Department's administration (e.g. secretariat of the Department).*
- *Form and function of academic services and infrastructure for students (e.g. library, PCs and free internet access, student counseling, athletic- cultural activity etc.).*

The administrative resources and staff support of the Department are inadequate. The faculty and students (especially the graduate students, doctoral candidates, and post-doctoral fellows) are obliged to shoulder a myriad of clerical and administrative tasks (like full proposal preparation, equipment repairs, copying, typing, etc.). Thanks to the extensive use of the Internet, access to course materials and library resources is widely available. There do not seem to be any athletic facilities to speak of at the University and the main building infrastructure of the Department is functional but marginally adequate. Unfortunately, it does not support access by individuals with special needs and physical handicaps.

RESULTS
- *Are administrative and other services adequate and functional?*
- *How does the Department view the particular results.*

The services, although challenged by the aforementioned factors, do become functional through a great deal of self-help and Herculean efforts by the faculty, the students, and the staff. The Department is not satisfied with the situation and it tries to leverage the resources it obtains from externally funded projects.

IMPROVEMENTS

- *Has the Department identified ways and methods to improve the services provided?*
- *Initiatives undertaken in this direction.*

The Department is fully aware of the limitations of its current resources. The University as a whole is an urban campus with buildings scattered over a tightly built section of Piraeus. The lack of State support, aggravated by the broader economic crisis in the country, makes it practically impossible to address the limitations and improve the shortcomings, except through sheer inventfulness and utilization of every available opportunity. The substantial reliance on the impressive externally funded resources (both domestic and international) is the sole alternative.

Finally, the very commendable effort of tracking the alumni must be continued and strengthened so as to engage them towards the welfare of the Department.

Collaboration with social, cultural and production organizations

Please, comment on quality, originality and significance of the Department's initiatives.

The Department is playing a leading role within Greece for fruitful interaction with the local community, schools, public institutions, and productive forces of Society (like Industry and the Marketplace). It has a commendable tradition of an outward attitude and outreach that has led to the impressive achievement of total professional absorption of its graduates in the job market. Its programme of Department visibility is innovative and effective but should be aggressively strengthened and improved.

The Department develops a large amount of open source software and maintains several collaborative projects with Industry.

E. Strategic Planning, Perspectives for Improvement and Dealing with Potential Inhibiting Factors
For each particular matter, please distinguish between under- and post-graduate level, if necessary.

Please, comment on the Department's:

- *Potential inhibiting factors at State, Institutional and Departmental level, and proposals on ways to overcome them.*
- *Short-, medium- and long-term goals.*
- *Plan and actions for improvement by the Department/Academic Unit*
- *Long-term actions proposed by the Department.*

The University of Piraeus, unlike many other Universities in Greece, enjoys a tradition of

friendly engagement with the local community. The Department, in particular, by the nature of its subject areas, is even closer to the productive forces of society and makes good use of its ties with Industry. However, at the State level, the antiquated legal framework that governs higher education, places a heavy burden and a literal stranglehold on the development of the Department. The rigid imposition of an excessive required teaching load, the inflexibility in the rules that govern the use of external funds, the extensive requirements for permits and approvals for the tiniest activity, and the many additional regulations have become a virtual rock of Sisyphean dimensions that restricts academic autonomy and freedom. Lack of tangible recognition of meritorious performance by faculty members and the unfortunate social upheavals that accompany the recent economic crisis, as well as the destructive remnants of unionized activities by students, staff, and, even, faculty, have all combined to make strategic planning a practical impossibility. Nonetheless, the Department did create a Strategic Plan that called for specific targeted resources and goals but enthusiasm for it wavered in the demoralizing climate of total State control. As a result, currently, the Department does not have a coherent Strategic Plan.

The recently passed new legal framework that governs higher education offers a unique, once-in-a-lifetime opportunity to break free from the insane embrace by the State and to establish full and real autonomy. As mentioned above, the Department does not have a credible Strategic Plan at this time despite its recent commendable effort of a few years ago. Yet, the development of a Strategic Plan is a necessity. A spotlight that points to the right direction is indispensable even in the middle of a dark tunnel. The Department does have the capability to create one and it is strongly urged to develop it. It needs to include measurable, quantitative goals so as to periodically assess progress towards achieving them.

F. Final Conclusions and recommendations of the EEC

For each particular matter, please distinguish between under- and post-graduate level, if necessary.

Conclusions and recommendations of the EEC on:

- *the development of the Department to this date and its present situation, including explicit comments on good practices and weaknesses identified through the External Evaluation process and recommendations for improvement*

- *the Department's readiness and capability to change/improve*

- *the Department's quality assurance.*

The bottom line of our evaluation is the pleasant and, somewhat surprising, realization that a unit created as recently as 1999 and with a current faculty size of only 22 individuals (with a healthy, but improvable, mix of genders) has created a world-class programme both in teaching and research with impressive accomplishments and success stories across the board of its coverage areas (that include both traditional areas like infrastructure systems, telecommunication networks, etc., as well as innovative application areas like e-learning, health systems, and security). This is not common in the Greek academic environment.

Below, we summarize our findings in terms of a list of strengths, weaknesses, threats, and opportunities, and conclude with a list of specific recommendations.

Strengths:

- excellence in research with documented international recognition
- solid academic programmes at both the undergraduate and the graduate levels
- forward and outward orientation and toward Industry and the Marketplace
- good programme of self-assessment and improvement
- positive attitude, high morale, and solid esprit de corps
- a unique mix of topic areas

Weaknesses:

- heavy and relentless control by the State
- inadequate human and infrastructure resources
- insufficient marketing and promotion mechanisms and activities for visibility enhancement
- lack of measurable goals and strategic planning
- somewhat unbalanced mix of depth and breadth in the curriculum
- lack of a crisp delineation of a research policy
- less-than-desired average quality of entering undergraduate students

Threats:

- The current economic crisis and potential continuation of government control may jeopardize its very existence
- Sustained government control may lead to demoralization
- Low quality of entering undergraduate students may undermine the Department improvement efforts
- A possible uninformed misinterpretation of its thematic focus and outreach methodology by officials and/or competitors may damage its reputation

Opportunities:

- The full exploitation of the degrees of freedom offered by the new legal framework in higher education can improve operations and facilitate the achievement of the strategic goals
- The exploitation of the tools of MOOC (Massive Open On-line Courses) will allow the Department to be at the forefront of emerging drastic developments in the field of higher education and anticipate and influence their form.
- Expansion of outreach to engage the significant Shipping Sector in Piraeus may lead to gifts and donations that will benefit the Department
- Aggressive pursuit of stronger ties with successful alumni may also lead to substantial benefits to the Department.

Recommendations:

1. Consistent and sustained development of a Strategic Plan with a dynamic process of revision as well as with concrete measurable objectives at all levels and areas of activity

2. Active participation in the development of the framework of Autonomy that the new legal framework permits

3. Development and deployment of MOOCs, initially as a pilot programme and, eventually, as a component of its academic programmes

4. Strengthening of commercialization activities like entrepreneurship, pursuit of patents, etc. , with incorporation of some of them in the academic curriculum

5. Improvement of the Department's visibility and the effectiveness of its marketing initiatives

6. Improvement of the balance between the breadth and the depth of its course offerings

7. Realignment of its research programme and plan so as to reflect more crisply its core competencies.

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