



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

HELLENIC REPUBLIC

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HELLENIC QUALITY ASSURANCE AGENCY

ΑΝΩΤΑΤΗΣ ΕΚΠΑΙΔΕΥΣΗΣ

FOR HIGHER EDUCATION

EXTERNAL EVALUATION REPORT

DEPARTMENT: Applied Mathematics (TEM)

UNIVERSITY: University of Crete, Heraklion

July 2011

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External Evaluation Committee

The Committee responsible for the External Evaluation of the Department of Applied Mathematics of the University of Crete consisted of the following five (5) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005 :

1. Professor Michael Akritas (President), Penn State University
2. Professor and Research Scientist Marianthi Markatou, Cornell University and IBM T. J. Watson Research Center.
3. Professor Manoussos Grillakis, University of Maryland, College Park
4. Professor Efstathios Paparoditis, University of Cyprus
5. Professor Yannis Kevrekidis, Princeton University

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

- Dates and brief account of the site visit.
- Whom did the Committee meet ?
- List of Reports, documents, other data examined by the Committee.
- Groups of teaching and administrative staff and students interviewed
- Facilities visited by the External Evaluation Committee.

II. The Internal Evaluation Procedure

Please comment on:

- Appropriateness of sources and documentation used
- Quality and completeness of evidence reviewed and provided
- To what extent have the objectives of the internal evaluation process been met by the Department?

The Committee arrived in Crete on June 6th, and had an initial meeting with the Vice-Rector for Academic Affairs, Prof. Papamattheakis and the Chair of the Department, Prof. Makrakis, where an introductory presentation of the University of Crete and the Department of Applied Mathematics and its history was made.

In the morning of June 7th members of the Department made the following presentations:

1. A brief introduction by the Chair, Prof. G. Makrakis, followed by
2. A presentation of the Department’s Graduate Program by Prof. Makridakis
3. A presentation of funded Research Programs by Prof. Tzavaras
4. A presentation of the Undergraduate Program by Prof. Kamvysis
5. A presentation of the Departmental Practical Training Program by Prof. S. Komineas
6. A Strengths-Weaknesses-Opportunities-Threats (SWOT) analysis by Prof. Katsoulakis

There followed:

7. A meeting with all Departmental Faculty Members

8. A meeting with the administrative and technical support staff
9. A meeting with the Visiting (407) Faculty Members
10. A meeting with the Departmental Doctoral students
11. A meeting with several (~20) undergraduate students

On Wednesday, June 8th, the Committee visited the Departmental Computer Labs, and then met with individual Faculty members of the Department as well as with the Chair of the Department of Mathematics. Finally, after a first deliberation, the Committee shared with the chairman its preliminary findings. The Committee continued its deliberations until the evening return flight to Athens.

The following documents were made available to the Committee:

- (1) The Departmental Internal Evaluation Report; (2) The Departmental Course Guide (Προγραμμα Σπουδων); (3) Departmental Research Publication Record; (4) Electronic copies of all the presentation material detailed in items 1-6 above; (5) Representative educational materials: (a) examinations in a variety of courses; (b) undergraduate student projects; (c) a Ph.D. Thesis; (d) Representative sets of undergraduate class notes. (6) the Departmental Web Site, containing, among other things, the program of a two-day alumni workshop entitled "Mathematical Finance and Professional Development".

The Committee felt that the Department and its Chair made a commendable effort in performing and documenting its internal evaluation report. The document was well written, detailed and informative. In the opinion of the committee it successfully addressed the Internal Evaluation requirements.

Every conceivable effort was made to provide the relevant data and documentation requested in a timely manner.

A. Curriculum --Undergraduate

APPROACH

- What are the goals and objectives of the Curriculum? What is the plan for achieving them?
- 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 ?
- Has the unit set a procedure for the revision of the curriculum?

This is a new Department, first established in 1999-2000 with the goal of cultivating modern

applications of mathematics, with an eye towards giving the students skills better tuned to the needs of the Greek and European job market. The cornerstones of the Department's vision have been, from its inception, the triptych of modelling, applied analysis and scientific computation. Modelling constitutes the essential component bridging applied mathematics with modern experimental/technological science (materials science, condensed matter physics, computational chemistry, rheology, nonlinear optics etc.). Applied analysis underpins vital modern developments in industrial mathematics, financial mathematics and ranges into such subjects as wireless communications. Scientific computation is anchored on numerical analysis for differential equations, and branches into areas such as computational geometry, discrete algorithms and imaging. These scientific directions interface successfully with the ITE/FORTH and the Computer Science Department.

This triptych underpins an undergraduate curriculum whose structure and flexibility in selecting directions and courses (including courses from other departments) is quite unique for a Department in a Greek University.

The curriculum is indeed consistent with the scientific objectives and perceived societal requirements, and other stakeholders (the University, local industry, specific other Departments – and even student's parents) were informed.

A standing Curriculum/ERASMUS Committee supervises the continuous revision of the curriculum.

IMPLEMENTATION

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

The structure of the coursework in "Basic Courses", "Core Courses" and "Specialty Courses", the latter appropriate for each of the three undergraduate directions, is, in principle, a well thought out implementation of the curriculum.

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

Having examined the syllabus of a number of courses, the committee believes that the curriculum compares favorably with modern applied mathematical curricula abroad.

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

We believe that the structure is indeed rational and clearly articulated (we in part addressed this above).

- Is the curriculum coherent and functional?

The curriculum is certainly coherent; there are certain issues with the functionality of the curriculum – regarding, for example, courses offered by other departments (service courses). There are also issues regarding appropriate staffing of courses in directions –such as operational mathematics, financial mathematics, statistics/biostatistics, discrete mathematics- where the Department did not develop a critical mass of faculty specialization or research expertise.

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

The combination of teaching and laboratory hours –with a general scheme of 4 hours in-class instruction and 2 hours of lab, computational or recitation- is quite appropriate.

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

Overall, the necessary resources are available with appropriately qualified staff and computer technicians. There is room for improvement for certain courses, and we will address it in our recommendations below.

RESULTS

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

The Department's predefined educational goals (mathematical methods and software development, mathematical modelling and numerical analysis, and financial/operational mathematics) are at the moment achieved at varying levels of success. For example mathematical modelling and numerical analysis in particular appear remarkably successful.

Data from the years 2003-2006 indicate that a number of the Department's undergraduate alumni have gone on to Greek and European postgraduate programs ranging in subjects from financial engineering and biostatistics to engineering and optics. A two-day workshop organized in May 2008, where Departmental alumni working in such financial institutions as ALPHA Bank, Eurobank EFG and J.P. Morgan came back to present their fields of endeavour, is indicative of the potential student benefits from this direction of study within the Department. Care needs to be exercised for the continuing support/development of the financial/operational mathematics direction.

- If not, why is it so? How is this problem dealt with?

As we have mentioned, we perceive a staffing problem in certain directions; a new hire in the algorithms direction should partially alleviate some of these concerns. As we will discuss below, we perceive a need in the financial mathematics direction.

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

They certainly do.

IMPROVEMENT

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

The Department is aware of the improvements that need to be made in the curriculum.

- Which improvements does the Department plan to introduce?

The curriculum would be definitely strengthened if courses were more freely available across Departments, especially for the students of this Department. The Department is cognizant of this, and, since this issue is an Institutional one, they will continue to approach the Rectorate of the University.

A. Curriculum – Graduate/Doctoral Program

APPROACH

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

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

The current Masters level graduate program is joint with the Mathematics Department, administered by the Mathematics Department, and governed by a standing Interdepartmental Study Committee that supervises course staffing and continuing curriculum revision.

The goal is to produce alumni with a solid mathematical education, mastery of scientific computation and software development and increased ability to collaborate with scientists in other disciplines. The curriculum was an evolution of the pre-existing Mathematics Department program, accommodating the creation and scope of the new Department.

The program offers, jointly with the Math Department, approximately twenty mainstream applied mathematics graduate courses whose subjects range from analysis to numerical PDEs to applied probability. Doctoral level students are also offered these courses, and, in addition, special topics courses are given in their areas of specialization (four such courses in the last few years).

The Department has now put together its own Masters level graduate program proposal which has been approved at the University level and is waiting for ratification at the Ministry level. The main motivation for the new program is the ability, through a more flexible selection procedure, to attract candidates from disciplines other than mathematics. For such candidates it may be inappropriate to initially face a purely mathematical entrance exam; they bring in a wealth of different expertise and fresh perspectives that directly link mathematics with the sciences, have strong foundations, and can certainly build up their mathematics abilities through the training provided by the program. This is established current practice in Applied Mathematics Departments/Programs in the US.

The goals of this anticipated Applied Math Masters level program is (a) to strengthen the research directions of TEM; (b) attract students beyond Greece, from the Mediterranean and broad European region and (c) enhance scientific collaborations of the Department. Three specializations are offered: Scientific Computing, Modeling in the Applied Sciences and finally Analysis and Applications.

The Curriculum is consistent with the objectives; the admissions process of the proposed program will serve the three goals mentioned just above.

IMPLEMENTATION

- How effectively is the Department's goal implemented by the curriculum?
- How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?
- Is the structure of the curriculum rational and clearly articulated?
- Is the curriculum coherent and functional?

- Is the material for each course appropriate and the time offered sufficient?
- Does the Department have the necessary resources and appropriately qualified and trained staff to implement the curriculum?

As discussed above, in the description of the graduate curriculum, the committee believes that this graduate program compares favorably with universally accepted standards for this area of study. The structure of the curriculum is certainly rational.

In a Departmental Masters Program it will also be easier for young faculty to be assigned the teaching of graduate courses in their area of specialization/interest, which can also serve as a means for attracting research students.

RESULTS

- How well is the implementation achieving the Department's predefined goals and objectives?
- If not, why is it so? How is this problem dealt with?
- Does the Department understand why and how it achieved or failed to achieve these results?

Many of the graduates of the Masters' program have gone on to matriculate in the Department's own doctoral program, as well as in well-respected applied math programs abroad.

Remarkably, all the Program's PhD graduates in the last five years have gone on to prestigious academic/postdoctoral positions, including (a) University of Maryland; (b) University of Vienna; (c) Oak Ridge National Laboratory; (d) University of Washington, (e) University of Erlangen and (f) University of Cyprus. The Department should be proud of these achievements.

IMPROVEMENT

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

The suggested improvement involves, as mentioned, the ability to attract graduate students from a variety of backgrounds. A new program has been proposed to address this. The Erasmus-Mundus program may provide the opportunity to attract foreign students to the graduate program.

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 basic teaching formula combines classroom instruction with computational laboratories and recitation sections in a 4hr / 2hr weekly combination (the main exception being instruction in computer languages/methods that have a heavier lab component).

The nominal student/staff ratio is often above international norms, and it certainly affects the teaching of laboratory classes which have to be given in several sections.

The prevailing impression the committee had during discussions with both undergraduate and graduate students was that the faculty was always accessible, and even eager to interact with the students (“their doors were always open”).

The Department has made every effort to keep computational resources up to date, and these computational laboratory facilities are heavily used by the students.

We have already mentioned the use of computer assisted instruction, software and laboratories. Class notes and sometimes textbooks are available on-line. The Secretariat has also advanced to a remarkable degree of on-line service provision (from registration to record-keeping, classroom planning, posting of grades etc.).

While the traditional final examination system is followed, there is a number of courses in which midterms and quizzes (even unannounced ones, sometimes even weekly unannounced ones!), as well as class projects –often collaborative ones- are assigned. The final grade is based on overall performance, and the students can inspect and discuss the fairness of their grading with the instructors.

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

As can be seen from the above discussion, teaching procedures in the Department are of high quality, and there is heightened responsiveness to the students’ needs.

Beyond class projects, there is the option of an undergraduate Thesis, which ~20 students every year elect to take advantage of.

A lot of faculty effort has gone in revitalizing a Practical Training option that can take place either in Heraklion (in banks, schools or local industry) or abroad. The appeal of the program would be greatly strengthened if the partial financial support during the training could cover basic student subsistence.

In addition, the Erasmus program gives the students the ability to study abroad for extensive

periods of time; language problems, lack of abundance of equivalent course selection, but most importantly, sufficient financial support is the inhibiting factor here too.

There is a system in place for collecting feedback about course and instruction quality at the end of each semester. We have perused a sample of these reports; we understand that the statistical evaluation of this raw data is something that the University plans to do centrally in the near future.

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?

The students we saw clearly identified with the Department, and –even though reasonable minor complaints always surface- they appeared satisfied, and even appreciative of their education, of the opportunities that such a program offers and of their interactions with the faculty. Having said this, there were two major issues:

- (a) Access to courses from other departments is very restricted, and for a Department such as TEM, where such courses are key components of the curriculum, this creates real problems. This is clearly a systemic problem of the way Greek Universities are organized, and it also seems to be an area where a little effort and good will can go very far in both quality of education and in the efficient use of resources. The physical separation of campuses (both local, between Knossos and Voutes, and more regional, between Heraklion and Rethymnon) creates serious problems. Hopefully the anticipated move from Knossos to Voutes will address the first level of this issue very soon (and provide many other benefits, to be discussed below). The distance to Rethymnon remains a problem.
- (b) All the interested students we saw were in their fourth and fifth (and even sixth) year. Everybody uniformly stated that “the first year (and even the second one) is lost”. This is clearly an issue for almost all first year students in the Greek system – not a problem of this particular Department.

This last issue is linked with the fact that the average time-to-degree is now at 6 years rather than 4. Part of the problem is also due to the gradual deterioration of the extent and rigor of mathematical education in the Greek high-school; this results in incoming students who are seriously unprepared to undertake modern mathematics studies at the right level.

It was brought to our attention that only two (out of several hundred) graduating students over the Department’s history have managed to achieve an overall degree of Excellent (8.5 and above). There seems to be a consensus among the students (at least partially acknowledged by the faculty) that grading is, to say the least, parsimonious. The department is cognizant of this issue.

IMPROVEMENT

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

The role of an official “undergraduate student advisor” has been established, and could alleviate some of these problems, if the students were more willing to take advantage of it. It could also possibly help if the department sought the help of more senior student peers in facilitating this interaction. It seems almost funny to the committee (and to the students themselves after a few years) that they were “afraid of the professors” as freshmen. A little more outreach might have a substantial effect here.

The (hopefully imminent) physical move of the Department, and the other two remaining Departments, to the new Campus should have a major effect in overall well-being at all levels: for the faculty, for the students, for the services, for the facilitation of interdisciplinary interactions etc.

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?

The initial call for this Department was to cultivate and promote the triptych of “Modeling, Analysis and Computations” within modern Applied Mathematics. It is obvious to the committee, based on the quality of the archival publication record of the faculty, that this is an excellent Department, and this assessment is based on international standards. Within the Greek educational system, this Department stands out. This is corroborated by the level of extremely competitive funding that the Department receives from the European Union.

Internal standards for the award of the PhD degree are as follows: (a) Qualifying exams are taken before students start their thesis. (b) A three person committee, in addition to the advisor, supervises research of Ph. D. candidates. (c) There are readers of the thesis who provide a written report, and the thesis is presented to a seven-member committee appointed by the Department.

For faculty members, appointment and promotion processes have standards set by University rules. In this Department there is a tradition that the Recommending Committee (Eisigitiki Epitropi) always solicits recommendation letters from international leaders in the field of the candidates. During the promotion procedure, quantitative measures of scholarship and productivity (beyond the number of papers, e.g. the number of non-self citations, the h-factor) are collected and discussed.

IMPLEMENTATION

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

There is a clear sense that the Department strives for research excellence and international competitiveness. This is corroborated by the faculty publication record, by the extremely strong research funding support and by the achievements of the PhD graduates. There is also a clear sense of vitality in terms of international collaborations, conferences and visits, as well as in a healthy visitor program and seminar, workshop and conference organization initiatives. There are also many lively collaborations with local Institutions like ITE/FORTH, and the committee believes that these can be fruitfully extended to other local entities like the Medical School.

The “face lift” that will be provided by the move to Voutes is vital for both the teaching and research function of the Department; apparently minor difficulties like a half-hour drive can put a damper on developing and sustaining collaborations and systematic interactions.

We have already referred to the publication record, the research funding successes and the international mobility and collaboration network that the Department has built. In particular, ACMAC creates an intellectually stimulating truly international environment and a palpable enthusiasm from which everybody benefits.

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.

In addition to individual faculty research efforts and work with graduate students, there are extensive and variegated collaborations between the faculty.

In terms of international recognition, two of the Faculty have been Marie Curie Fellows (Prof. A. Tzavaras, 2002-3, and Prof. M. Loulakis, 2001-2) and one has been awarded an ERC ADAPTIVES grant (Prof. Tsogka). There have also been invited lectureships and visiting scholarships (e.g. Prof. Katsoulakis).

IMPROVEMENT

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

As far as this committee is concerned, it would be admirable if the Department can keep up this level of productivity and vitality.

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?

Secretarial and technical support is provided with competence and professionalism, and appears to be adequate for the needs of the academic staff and the students. The secretarial staff seems to go beyond the call of duty in order to help students and faculty. The extensive computational component of the curriculum puts a heavy burden (especially for large classes) on the hard-working technical support staff. The Department makes a conscious effort to keep the hardware reasonably current. Almost all secretarial procedures are offered electronically.

Given the imminent move of the Department to a different campus, and the gradual fall to disuse of the current building, issues of student presence on campus should better be faced by the Department after the move.

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 secretarial staff includes four members, and there is a three-member technical staff for computer lab support. The Committee visited the Departmental computer labs and was briefed on the Department's implementation and support of student computer and internet access. The students also offered positive comments for the Library (which, however, closes too early!); we expect that things will be different after the move to the new campus.

RESULTS

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

Modulo the imminent move to the new building/campus, the services are of high quality.

IMPROVEMENTS

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

Once again, every effort has been made (even in hard economic times) to keep the computer labs supported and their hardware/software updated. On the software front, keeping always in mind financial constraints, the committee recommends the use of the free software package/programming language R instead of the expensive commercial package MINITAB. R is versatile and supported by the statistical community.

There will, of course, arise a need to redesign the Departmental laboratories once the move to the new campus takes place.

Collaboration with social, cultural and production organizations

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

The Department has a PR Committee whose function is to educate and inform the public and, in particular, high-school students, about the identity and mission of the Department.

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.

An important inhibiting factor that hopefully will be soon mitigated is the physical isolation of the Department (as well as of the Math and Computer Science Departments) from the rest of the Campus at Voutes. The progressively deteriorating state of the current buildings affects quality of life and instruction on a daily basis; furthermore, the physical distance makes integration and communication with other units more difficult. For example, attending an interesting seminar in the physics or biology departments becomes nontrivial; also, for the students, attending courses at a different campus makes planning more complicated.

Especially for this Department, whose curriculum requires courses from other Departments, the lack of instruction integration (in the form of what is called "service courses") across Departments is a real problem. This problem arises at the Institutional level, and it is at the Institutional level that it should be addressed. This committee believes that addressing this would benefit not only the particular Department, but it would also contribute to the much more effective allocation and use of teaching resources across campus – an important consideration these days.

Another consideration with respect to the curriculum is the fact that most students do not take advantage of practical training options (and especially international internship options), due to lack of sufficient subsistence funding from the organizations that provide the internship during its period.

Perhaps the most vital problem of the PhD program is the lack of a systematic way to consistently financially support the PhD candidates. Currently this is done haphazardly, through partial foundation fellowships (if and when available) and through external research funds.

However, calls for the competitive programs through which one can obtain such funds, are notoriously inconsistent in terms of timing– and the continuity, without which one cannot go through an entire thesis, is seriously compromised. The fact that certain large grants (like this Department’s ACMAC) explicitly do not allow graduate student support exacerbates this situation. This is clearly a problem at the State level, and is shared by all Greek Universities.

Another common State-level problem that affects the life of young scientists is the terrible lack of consistency in the disbursement of payments for visiting faculty instructors (“407 faculty”). Their professional security is already nonexistent (they are appointed from semester to semester); given this, the delay of payments by many months makes their subsistence even more precarious and is cruel.

It also appears that the mechanism for disbursement of state funds to the University and the Department regularly hits certain snags (funds become available in March rather than January, funds have to be expended by November rather than December....) and that can create unnecessary difficulties in carrying out normal departmental functions.

In the short term, the Department expects several newly elected faculty members to arrive and become integrated; one of these appointments is in the algorithms/computer science area, two are in applied probability and stochastic processes, and one is in Partial Differential Equations.

On the other hand the faculty member that anchored the financial mathematics educational direction (Prof. Athanassopoulos) is transferring back to the Mathematics Department, and another faculty member servicing this direction (Prof. Loulakis) has just moved to NTUA. This will certainly create a problem with staffing this direction. We understand that the Department does in principle have a few available faculty lines that could be used to support this direction; however, in the current uncertain climate, it is not clear when these positions can actually be filled.

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.

This Department has, on the whole, an internationally recognized research faculty. The publication track record and the success in extremely competitive EU funding (e.g. ACMAC, ERG) clearly attest to this. On the educational front the faculty are truly available and open to interactions and this creates a positive learning environment. Young faculty as well as visiting (407) faculty say they are treated as true peers. Workshops, seminars and visitors (one of the good outcomes of successful external funding) create a truly stimulating environment, full of vitality. Active collaborations stretch across Europe and the US, but also across Greece, and take advantage of some of the local Institutions (e.g. ITE/FORTH). The

Department has many alumni success stories to show (from undergraduates to the consistently successful PhDs) and this creates a sense of pride in their accomplishments.

Upon its inception, the Department envisioned itself as supporting three main research and education directions. Certain areas (analysis/modelling/applications/numerical analysis) have been extremely successful and well populated; another area (algorithms) is small, but hopefully poised to modestly grow. The financial mathematics area, however, which was actively serviced by two faculty members, appears to be losing both of them at the moment; no immediate plans seem to be in place for continued support of this area.

On the educational front, we believe it is possible that a more active orientation program for beginning students, possibly with the participation and assistance of senior students, and a more creative enforcement of the existing “student advisor” mechanism may shorten the endemically long time-to-degree.

Given that this year the Department is losing both people supporting its (by their own admission) significant financial mathematics areas, it is an opportunity to formulate a coherent strategic plan, identifying areas of priority that will retain or possibly reshape the identity of the department. It appears to the committee that a strong connection with the medical school is timely and natural, and might enhance the research and educational agenda of the department.

One of the most vivid memories of this committee was the agony expressed by the PhD students and visiting (407) faculty regarding the current situation and their future prospects. This agony was less explicit, but still present, in our interactions with the undergraduates, and in discussions with the faculty.

Readiness to change/improve. The high academic credentials and the professionalism of the faculty constitute a guarantee that the department has the ability to evolve in promising directions in the future as opportunities arise.

Quality assurance. At the undergraduate level the Department has instituted a feedback process for course evaluation. In addition there is a standing UG curriculum committee which supervises and updates UG courses. A standing Graduate curriculum committee plays the same role at the Masters’ level. There is a supervisory committee (in addition to the advisor) for each PhD student, there are Departmentally administered qualifying examinations, and there is thorough reading, examination and approval of each PhD Thesis. Standing rules for appointments, promotions and tenure are strictly adhered to; there is a consistent effort to invite international experts to serve in each committee, and quantitative indicators of productivity (e.g. number of non-self citations) are considered. We feel that the system in place is a good quality one and that it is functional; it is not in need of any substantial enhancement or change.

The Members of the Committee

Name and Surname	Signature
1.	_____
2.	_____
3.	_____
4.	_____
5.	_____