



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ

HELLENIC REPUBLIC

**Α.ΔΙ.Π.**

**H.Q.A.**

ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ & ΠΙΣΤΟΠΟΙΗΣΗΣ ΤΗΣ  
ΠΟΙΟΤΗΤΑΣ  
ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

HELLENIC QUALITY ASSURANCE AND  
ACCREDITATION AGENCY

## EXTERNAL EVALUATION REPORT

DEPARTMENT OF MATHEMATICS

UNIVERSITY OF ATHENS

April 2012



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### **External Evaluation Committee**

The Committee responsible for the External Evaluation of the Department of Mathematics of the Kapodistrian 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 Stephanos Venakides (President)  
Duke University, Department of Mathematics, USA
  
2. Professor George Roussas  
University of California at Davis, Department of Statistics, USA
  
3. Professor Yannis Manoussakis,  
University Paris XI, Department of Computer Science, France
  
4. Professor Athanase Papadopoulos,  
IRMA, University of Strasbourg, France

## ***Introduction***

### I. The External Evaluation Procedure

The committee arrived at the National Kapodistrian University of Athens (NKUA) in the morning of Monday April 2, 2012, and was welcomed by the University Vice Rector, the Dean of the School of Sciences, the Department Chair and the Internal Evaluation Committee. The committee spent the entire days of Monday, Tuesday and Wednesday attending presentations, having meetings with faculty, students and staff. The visit concluded with a meeting with dean H. Papageorgiou, chairman G. Kalogeropoulos, vice-chairman I. Emmanouil and professor A. Bournetas, chair of the internal evaluation committee.

The presentations attended were on the

- Section of Mathematical Analysis: Professor A. Tsarpalias
- Section of Algebra and Geometry: Assoc. Professor D. Lappas
- Section of Statistics and Operations Research: Assoc. Professor N. Papadatos
- Section of Didactics of Mathematics: Professor T. Zachariadis

The committee held meetings with the following

- Director of the Undergraduate Curriculum Committee, Assoc. Professor D. Lappas
- Director of the Graduate Program Steering Committee, Professor A. Melas
- Faculty members of the Section of Mathematical Analysis
- Faculty members of the Section of Algebra and Geometry
- Faculty members of the Section of Statistics and Operations Research
- Faculty members of the Section of Didactics
- Undergraduate students in small and in large groups selected randomly
- Group of eight outstanding undergraduate students
- Graduate (master) students in a class selected randomly
- Group of PhD students
- All the staff members in their place of work

The committee visited

- The library of the School of Sciences
- The Department Computer Lab
- Department classrooms and amphitheaters

The work of the committee was briefly disrupted twice by a group of students who introduced themselves as elected representatives and/or as supporters of political parties. We were surprised by their ignorance and misinformation on the mission of the committee.

At some point, a questionnaire was placed by a student in the hands of a committee member as to how the committee report could influence various educational aspects of the department. The committee looked upon this document as an indication of the anxiety and insecurities of the Greek youth about the present and future and gave its content due consideration.

List of Reports, documents, other data examined by the Committee.

- Report of internal evaluation, May 2010
- Additional data provided by the department at the request of the committee including faculty and staff CVs
- Guide of course offerings at the undergraduate level 2011-2012 (Οδηγός προπτυχιακών σπουδών 2011-2012)
- Document containing the most important research results by faculty, provided by the department
- Annual report 2010-2011
- Graduate program guides
- University statistical data provided by the office of the vice-rector
- Mathematics student statistical data.

The committee found the above documents to be complete and informative. Any information requested by the committee, was promptly provided.

## **A. Curriculum**

*To be filled separately for each undergraduate, graduate and doctoral programme.*

### **UNDERGRADUATE PROGRAM**

The undergraduate mathematics program, declares itself a 4 year program, but reports a graduation time average of 6.3 years, while the more meaningful measure of the median (how long it takes half of a class to graduate) is over 7 years. The committee finds this gap unacceptable. The committee believes that two factors, curriculum and class effectiveness, are responsible for this as well as for the related issue of very high student course failure rates. The curriculum is discussed here and class issues are discussed in the section on teaching. The fact that the law allows for perpetual students is, of course, another significant factor.

The undergraduate mathematics curriculum is divided in three groups of courses: mandatory, restrictive elective and free elective. For a degree in Mathematics to be conferred, a student must pass a total of thirty six courses subject to the following minimal requirements.

- Fourteen mandatory mathematics courses
- A number of “restrictive elective courses” that varies for each specialty
- A number of elective courses
- Two course in physics
- Three courses in didactics

The majority of the fourteen mandatory courses is solid and in line with international standards. Nevertheless, the committee feels that 36 courses required for the degree are too may under their present structure. The number may remain the same, but the duration of each course should be reduced. A typical course should consist of three lecture hours and one discussion or exercise session, suitably grouped. Furthermore, the requirement of two courses in physics should become broader, allowing the two courses to be selected by the student from a list including physics, chemistry, cosmology, biology, economics, etc. The number of restricted alternatives should be expanded by transferring some courses from the list of elective courses. The list of courses in the elective category may be condensed by collapsing courses of very similar content; for example, courses 121, 221 and 432 may be combined into two courses; courses 331, 615, 733 and 734 may be eliminated without jeopardizing the integrity of the program. Other arrangements are appropriate, such as moving Complex Variables (701) to the first semester of the third year. These adjustments may also resolve some of the overloading problems regarding the teaching duties of faculty members which , as we heard, are much heavier than mandated by law. This will also enhance their ability to engage in research activities

### **GRADUATE PROGRAM**

Master and doctoral students seem to be, in generally, happy with their advisors and with administrative support. They find the duration of their studies reasonable. However, master students think that the restricted elective list should be expanded. Also they think that some courses, although required, are not offered often enough. Funding for professional travel (participation to conferences, etc.) was brought to the attention of the committee members multiple times and persistently, by doctoral students.

The curriculum associated with the master studies is very reasonable.

## ***B. Teaching***

Teaching in general is good although variations in the quality of delivering a course exist. For example, few professors, especially two, have been singled out for the high quality of their teaching, and on the other extreme, at least one was judged as being inadequate in his teaching. It seems that the e-class components of some courses or professors (posting notes, exercises, etc.) were highly appreciated by students. It would be desirable that this practice be expanded to all courses. The department has trained some excellent students. The committee applauds the efforts of the department to prepare top students for international mathematical competitions and for the performance of the students in these competitions.

Nevertheless, the high percentage of failure in final exams and consequential long graduation times may be attributed in part to the present mode of teaching. It has been mentioned to the committee that about twenty per cent of the undergraduate students take private tutoring to prepare for the exams. This fact is as deplorable as the most likely explanation that was given, namely, that many students do not attend classes and start serious study only a few weeks before exams, i.e. about the time they receive their course textbooks. In order to rectify this situation, the committee feels that there should be at least one mid-term exam and/or regular homework for which students receive pre-announced credits. The mid-terms or the homework may be graded by post-graduate (i.e. doctorate, or even masters) students for a monetary compensation. The committee feels strongly that it is the university's obligation to provide for such funding. Introducing regular homework and midterm exams is widely supported by students interviewed. As a further benefit, this approach alleviates placing success or failure of a student onto a single exam, which cannot possibly measure effectively a student's ability and preparation.

The textbooks seem to be an issue in the educational process, since, as a rule, there is a single book used in a course usually without reference to any other books on the same subject matter, even in Greek, let alone in foreign languages. Also, a case was mentioned where two volumes of a book were required for a semester course. It would be entirely appropriate that instructors compile a syllabus and make it available at the beginning of each semester, providing all relevant information regarding the course, such as: Instructor's name and email address, brief description of the course, weekly office hours posted in front of the office and also in the web page, the date(s) of mid-term(s) to be given, policy on homework assignment, and the way mid-term(s) and homework are entering into the semester grade for the course, and a list of books in Greek and foreign languages on the subject matter. The books selected or referred to must contain a number of concrete examples and exercises. Should that not be possible, the instructor must provide a supplementary handout to this effect. It should be highly desirable that textbooks for basic introductory courses such as differential and integral calculus, linear algebra and differential equations be carefully selective with a view of being used for more than a year. Students should receive their books before classes begin.

The committee found that students appreciate access to instructors. It should be enforced by the chair, that all faculty post office-hours on their office doors every semester and keep these hours. It is to be understood that it is the instructor duty to promptly respond to reasonable email requests by students. This is already practiced by many faculty members. Furthermore, students should be allowed to examine their final exams. A reasonable procedure for this is for the department to set a date per exam session for this to take place, or for each professor to mention such a date in the syllabus. Finally, the

department has to take special care and make arrangements for working students. Under the current social circumstances, the percentage of such students may be relatively high.

A factor that plays a significant role in creating long graduation times and large failure rates is the existing gap between the lyceum and the university. This gap may be bridged by suitably adjusting the level of lectures, establishing communications with lycea and bringing to the university campus groups of students, and more importantly establishing summer schools in mathematics for the benefit of lyceum students. The committee takes exception to the apparent fact that the department does not pay due attention towards some practical problems related to the Erasmus exchange program. For instance, the future Erasmus students should be allowed to have a special exam before the official date so that they can start their semester in the university they are visiting in due time. Furthermore, the committee finds it unacceptable that the duration of the total of the 3 final exams period is 10 week, whereas both in Europe and in the US the exam period after each semester does not exceed two weeks, including the preparatory study period. We understand that the existing exam system as well as the way of making the relevant decisions lies outside the department authorities. The proposed earlier mid-term/homework may alleviate this problem. It is also felt that the central administration of the university should help rather than hinder the educational process. Finally, it has been repeatedly mentioned to members of the committee that results of some of the final exams are not promptly announced with the consequence to find the students unprepared to decide about the next semester. A proper deadline set and enforced by the department should resolve this issue.

In case that a course is taught in more than one section, the instructors involved should design the common final exam in accordance with the material taught by all instructors. Also, it seems to be a practice that certain instructors teach the same course or series of courses for a large number of years. Pedagogically, this is unacceptable and the common practice is that such courses rotate among faculty members.

In order to cover the teaching needs, we hear that the faculty work under a heavier teaching load than mandated by law. The reduction of course hours recommended above will alleviate some of the overloading problems. On the other hand, instituting midterms and regular homework, even with grading done by doctoral students, increases the load. The committee feels that the overall effect will be to ease the overload somewhat and enhance the faculty ability to engage in research activities. Another stressful factor is that the number of mathematics students admitted each year is specified by the Ministry of Education as a multiple of the number recommended by the department. This produces a large population of students who become inactive or inexcusably negligent of their duties. As there are legal obstacles for dropping such students, an organizational mess ensues, that affects faculty time and morale adversely. The ministry must act to help the department solve this problem.



## **C. Research**

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

Research is of paramount importance in A university worth its salt. It is justifiable that our standards should be high in judging the Department of Mathematics of the University of Athens, the flagship of the mathematics departments in Greece, the birthplace of mathematics. The committee has noticed that the faculty members are stratified among very active, relatively active, and almost inactive members. In general, high quality of research is associated with younger and mid-aged faculty members, although not exclusively. Some of the senior members still produce quality work. Some papers have appeared in top journals, a substantial number have been published in mean stream journals whereas others have been printed in obscure outlets. Publications in refereed proceedings and individual volumes of quality are also to be noted. Some Master theses are of a high level, and were published in very good journals, E.G., Proc. AMS, Proc. London Math Soc., Trans. London Math. Soc. and others.

The committee was pleased to observe that the policy regarding hiring of faculty members has been improved during the last few years bringing some truly bright new mathematicians. The same criteria should have applied for members put up for promotion. Unfortunately, this has not been the case during the last few years.

It is commonly understood that research funding from resources of the Greek government is scarce. Although this is not to be passively accepted, it is important, nevertheless, for the university to intensely exploit funding possibilities from EU sources. To this end, faculty members should be decisively helped logistically by the central administration of the university. It is our understanding that this is not happening currently. The committee recommends strongly that the university administration makes it a priority of providing funding for doctoral students.

It should be understood that salary savings from people taking unpaid leave of absence should remain with the department for the purpose of attracting visiting scholars, supporting doctoral students and other research activities. The proposed practice will also encourage people to take leaves of absence with the obvious academic benefits to themselves and the academic/monetary benefits to the department.

It is commonplace to say that decisively intensifying the collaborative research efforts with foreign scholars will help raise the visibility of the department. Also, attracting highly accomplished senior faculty members with international reputation will go a long way towards achieving such a goal.

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

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

Regarding the administrative staff, it is the impression of the committee that it discharges its duties effectively with regards to aspects of undergraduate students. This is perhaps due to the fact of extensive use of electronic means. Whatever deficiencies may exist regarding service to graduate students may be remedied with the introduction of electronic means as well. Such a process and other internal re-arrangements will also release staff time to be used for other purposes, expanding the time that the secretariat receives students, and train a staff member in the preparation of grant proposals. We do understand that obtaining this training is hard and requires that the person displays dedication, initiative and gets support from the department. Such a person would be an asset to the department.

The library of the mathematics department is common to other sciences. It is pleasant, spacious and comfortable and the students use it efficiently in order to study. It contains a good collection of periodicals and books, there are several electronic subscriptions to journals and a large number of computers are placed at the disposal of the users. The personnel is helpful and friendly. There may be a more efficient way of placing books on shelves. Committee members were unable to locate books where they should normally be, despite the fact that the books were available at the library.

The web site of the department should be seriously upgraded to become a powerful tool of promoting the department in Greece and abroad and enhancing the student's consciousness of what modern research in mathematics is. The committee points to the website of Duke university (created and maintained by two people) as a model. We strongly recommend the hiring of a second staff member for a similar project for the department. If such hiring is not possible, we believe that computer-talented students can produce miracles for a small monetary compensation in addition to the work experience with which such a project will enhance their CV. We also recommend that a database be created in which faculty enter their activities annually, making departmental statistics and planning a much simplified task. Also it would be most useful if the department or the university provide email addresses for the students, facilitating communication between the university or the department and the students.

As a last remark, students repeatedly complained about a lack of sufficient bus service within campus and even more so, service to the campus from the city. The committee also found striking the fact that the university has no central interdepartmental mail service. The department should be able to take better maintenance of its physical facilities including classrooms and amphitheaters

### ***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.*

In the midst of the critical and chaotic situation that the country finds itself, it is almost oxymoron to talk about strategic planning and setting goals for the future. How could that happen when the Ministry of Education, succumbing to pressure groups, adopts a regressive attitude and thus creates uncertainty as to the legal regime of tomorrow, not to mention the sense of contempt for the rule of law itself; when university authorities at the highest level place their perpetuity in office ahead of the well-being of the university; when it takes years for the appointment of an elected faculty member; when it requires a ministerial decree for a temporary appointment of a graduate assistant; when desperate effort for research funding by faculty are drowned in the ever present bureaucratic mess, and the fair minded evaluation is always in doubt; when dedicated faculty and students have to live in a climate of intimidation and even terror by the usual noisy vocal minorities of students and even sometimes faculty members; when it is deemed commonplace and natural that only a small percentage of students pass a class; when students receive textbooks after, not before, classes start, and often study only a few weeks before final exams. Under such circumstances, it is indeed remarkable that pockets of excellence among faculty and students still exist in the Department of Mathematics. Their persistence for individual and national survival, despite the irresponsible national leadership at several levels, and the cumulative corrosive effects of the leveling of principles and values, is nothing short of admirable.

Strategic planning and setting goals for the future becomes somewhat meaningful in the following context. The department has an aging faculty. For example, the committee was told that fifteen faculty members of the analysis sector and eight members of the algebra/geometry sector are above sixty. Provisions must be made for the replacement hires to be world class mathematicians. This renewal is a unique opportunity for the department to enhance its research status spectacularly and move towards placing itself by the side of great European institutions. Mathematics is an area in which Greece can and should compete in the world scene. This opportunity to restore some of the wounded pride of Greece must be recognized and set as a goal at the institutional and government level. In spite of the dire economic situation of the country, the funding of the department must be maintained, even increased, as long as the department is seen to move decisively towards academic excellence.

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

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

The committee feels that the following list of actions and measures that will have a serious positive impact on the department's pursuit of excellence.

- Use scarce faculty positions extremely carefully. Hire the best available candidates to new positions or none at all if such persons are not available.
- Maximize the number of faculty positions by hiring superior external candidates in case of open promotions.
- Cultivate collaborative work with domestic and foreign scholars, preferably with visits in place.
- Intensify efforts to obtain grants from domestic and EU sources.
- Introduce the concept of a syllabus, as described earlier, in order to maximize the faculty contact with students and provide more complete information regarding course requirements.
- Introduce the concept of mid-term(s) and regular homework, with a parallel effort to ensure graduate student support for the grading of papers.
- Re-organize the curriculum offering, as suggested earlier, with a view of facilitating student studies and also providing relief to faculty.
- Intensify contacts with lycea students either by bringing them to campus for a day's visit or, better yet, by organizing summer schools.
- Adopt departmental-wise the practice of using e-class support.
- Create a superior e-environment including website, intranet and a data base as described above.
- The department should spare no efforts in finding ways and means of reducing or eliminating the number of inactive students.

In conclusion, the committee wishes to acknowledge the fact that it was very well received by the faculty, the departmental administration and staff, the dean of the School of Sciences, and a vice-rector of the university. In particular, we wish to acknowledge the efficient organization of the material and activities of the committee by the chair of the internal evaluation committee.

The committee was particularly moved by the willingness, and indeed eagerness of students to talk to committee members about their problems, plans and ambitions. This was done at a small group level, as well as in a classroom setting; in the latter case, despite attempts of disruption and intimidation by the usual suspects.

The Members of the Committee

**NATIONAL & KAPODISTRIAN UNIVERSITY OF ATHENS**

**DEPARTMENT OF MATHEMATICS**

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