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HELLENIC REPUBLIC
H.Q.A.A.
HELLENIC QUALITY ASSURANCE AGENCY
FOR HIGHER EDUCATION

EXTERNAL EVALUATION REPORT

DEPARTMENT of Chemistry, University of Ioannina

September, 2011

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External Evaluation Committee

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

1. Professor D. Coucouvanis, Chair
University of Michigan (USA)
2. Professor D.S. Argyropoulos
North Carolina State University (USA)
3. Professor C.A. Floudas
Princeton University (USA)
4. Professor A. Giannis
University of Leipzig (Germany)

Introduction

I. The External Evaluation Procedure

- Dates of the site visit

The visit was carried out from the 8 pm of the 11/9/2011 up to the 8 pm of 13/9/2011.

- Whom did the Committee meet ?

Academic staff:

An informal meeting with Prof. T. Albanis (Rector of the University of Ioannina), Prof. K. Kapsalis (Vice rector of the University of Ioannina) and Prof. F. Pomonis, took place in the evening of 11/9/11. During this short meeting the external evaluation committee (EEC) had the opportunity to discuss the general features of the University of Ioannina (UoI) and of the department of chemistry.

Day 1, Monday, September, 12, 2011:

At the beginning of the evaluation process, a general presentation of the chemistry department of the UoI took place: The Rector of UoI presented a summary of the internal evaluation as well as a history of the university, curriculum, organisation, structure of the administration, research units, activities etc. The chairman of the Chemistry Department Prof. V. Tsikaris outlined the academic and social activities of the department. He also presented details of the internal evaluation process, teaching staff and teaching work, research activities (including publications and bibliometric data), and conclusions.

Prof. Varvounis presented in detail the curriculum of undergraduate studies whereas Prof. Kovala outlined the practical training for the students of the department.

Finally, Prof. Tselepis presented the curriculum of graduate studies.

Subsequently, details of the curricula of graduate studies were presented: Biotechnology (by Prof. Koukkou), Agrochemistry (by Prof. Albanis), Bioinorganic Chemistry (by Prof. Plakatouras), and "Food Science and Nutrition" (by Prof. Kontominas and Prof. Demertzis).

In addition, activities and organisation of the following sections were presented: a) Inorganic and Analytical Chemistry (by Prof. Stalikas), b) Organic Chemistry and Biochemistry (by Prof. Lekka), c) Industrial Chemistry and Food Chemistry (by Prof. Pomonis), and d) Physical Chemistry (by Prof. Mylona).

At the end of the first day, the research and educational activities including names of the members, research metrics collaborations and facilities of the following laboratories were presented: a) Inorganic Chemistry (by Prof. Louloudi), b) Analytical Chemistry (by Prof. Stalikas), c) Organic Chemistry (Prof. Skombridis), d) Biochemistry (Prof. Sakkarelou), e) Industrial Chemistry (by Prof. Pomonis), f) Food Chemistry (by Prof. Kontominas and Prof. Demertzis), and g) Physical Chemistry (by Prof. Mylona). It is worth noting that several PhD students of all divisions of the Chemistry Department participated in the meetings.

We had the opportunity to visit many of the departmental laboratories as well as the laboratories for practical courses (food chemistry, inorganic chemistry, physical, environmental chemistry, and biochemistry). During these visits we had also short discussions with the corresponding group leaders, laboratory instructors and students.

Due to time limitations and the subsequent takeover of the chemistry building by the students it was not possible to visit the organic chemistry labs. This failure to visit the organic laboratories prevented the committee from evaluating functional and safety operations of the experimental chemistry infra-structure.

All presentations were detailed and informative, questions were asked and problems discussed. All the presentations were given to the members of the external evaluation committee in printed form and as a USB-stick.

Day 2- Tuesday, September, 13, 2011

The EEC met with the personnel of permanent contracts as well as personnel with special contracts (IDAX, ETEP, EIDIP) and discussed their problems. Subsequently the EEC visited the central library and the student restaurant and met also with the librarian and the director of the restaurant.

The EEC also had a few interviews with members of the research and teaching staff of the Chemistry Department, as well as with graduate students and PhD students.

Summary: The Department of Chemistry managed to prepare a program that allowed meetings and discussions with members of all divisions of the department. Unfortunately, in the second day of the visit the students occupied the chemistry building and forced an alteration of the visit schedule. In the meetings held, the majority but not all of the members of the teaching staff or group leaders were present. It was gratifying that in all these meetings the rector of the UoI was present. The EEC had the opportunity to speak to laboratory instructors, to visit the laboratories, as well as the research laboratories of all divisions. We also met and talked with representatives of the students (graduate, masters and PhD students; a total of 18 students).

II. The Internal Evaluation Procedure

- *Appropriateness of sources and documentation used*

The documentation concerning the internal evaluation till 2009 was received by the members of the external evaluation committee about 6 weeks prior to the evaluation process. Additional material with detailed information concerning several research and educational aspects and activities (see above) were received during the visit.

- *Quality and completeness of evidence reviewed and provided*

The furnished report of the internal evaluation reflects the current situation (i.e., number of students refers up to 2010; the actual number and list of current departmental staff), clearly describes the structure, organisation, and duration of the entire degree.

- *To what extent have the objectives of the internal evaluation process been met by the Department?*

Overall the Internal Report was exceptionally detailed, professional and met the objectives of the Evaluation Process.

A1. Undergraduate Curriculum

Goals and objectives of the Under-Graduate Curriculum (UGC)

- *What is the plan for achieving excellence?*

Recently the department applied a program aimed at upgrading and modernizing the way chemical education is offered with emphasis being placed toward the application of modern methods of material dissemination that goes beyond the traditional lecturing approach including inquiry based learning and tutoring. The overall duration of these studies requires a minimum of 8 semesters.

The updated structure of the curriculum is of comparable depth and value as per international peer institutions. While undergraduate laboratory attendance is mandatory and by extension successful, the lack of mandatory attendance (even at a minimum) during theoretical instruction is in general considered as a weak element. During the evaluation the analyses provided, of the material used in the classrooms and the laboratories, were in general satisfactory with the exception of the fact that no details as to the textbooks used were provided. However, the presence of translated, internationally renowned, texts in Greek (specially in core chemical subjects) offers confidence as to the availability of adequate instructional materials. Of significance in this respect is the presence of outstanding library facilities that the committee had the opportunity to visit despite the student's occupation of the university during the site visit.

- *How were the objectives decided? Which factors were taken into account?*

Within the undergraduate curriculum the department claims and offers an apparent cohesion (amongst the four sectors of the department) that allows for the effective and complimentary dissemination of the educational material. Overall, the educational background of the instructors is considered excellent and well positioned for offering a high quality educational experience.

However, one notes the lack of a series of pre-requisite courses within the structure of the undergraduate curriculum inducing some deficiencies as to the effectiveness in the teaching of the Chemical Sciences. When this is coupled with the lack of formal undergraduate student advising, it forms the foundations for the creation of an unfocused and perhaps confusing educational system.

A disturbing indication that may require some departmental attention is the fact that for the period 2002 to 2009 the average grade received by nearly 450 undergraduate students was 6.5. This low average grade may well be the result of the lack of prerequisite course requirements.

It is important to note at this point that the relations between the professoriate and the students were found to be of an excellent quality (particularly within the ranks of the graduate students). This factor could somewhat compensate for the lack of advising. Overall, however, it is recommended that both advising and pre-requisite requirements need be implemented in anticipation that this will improve the overall performance of the undergraduate students.

IMPLEMENTATION

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

A rather successful program in chemical education in both graduate and undergraduate levels has been put in place within the department of Chemistry at University of Ioannina with curricula that emulate those of peer institutions. As such the training of graduate and undergraduate students is seen to produce chemists who adequately meet the needs of the local economy.

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

-

With the exception of the absence of prerequisite requirements and the limited advising the curriculum compares well with accepted standards

Is the structure of the curriculum rational and clearly articulated?

The orderly operation of the classroom, the laboratory instruction and the thorough syllabi are all factors indicative of a well structured curriculum. However, we were not offered to examine specific study guides or other instructional material that may have supplemented our view.

- *Is the curriculum coherent and functional?*

Yes based on the above considerations

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

In general this is seen as adequate, especially within the structure of the revised curriculum.

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

The departmental facilities within the two existing buildings (X2 and X3, completed in 1992) provide classrooms and laboratories of good quality, well taken care of, and well equipped. Similarly the same applies to modern instrumentation, library, and study halls. It is important to note that in more than one laboratories housing important, expensive, instrumentation, smoking was allowed. This practice is detrimental to the condition of the instruments and should be discouraged. One needs to underline here that these facilities and the overall programs are maintained and executed under conditions of serious financial constraints. The apparent successes are most likely due to the fact that the department consist of a large number of exceptional and dedicated faculty and instructors who lecture and prepare the laboratories respectively. The committee became aware and appreciates the solvent collection and recycling program initiated and exercised by the department. This promotes an understanding of environmental issues by the students and the need for professional accountability.

RESULTS

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

The new curriculum will be implemented within the first few months of 2012, precluding any evaluation.

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

N/A

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

N/A

IMPROVEMENT

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

The new curriculum will soon to be applied, so it is too early to evaluate the necessity of any improvements.

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

N/A

A2. Postgraduate Curriculum

Goals and objectives of the General Post-Graduate Program (GPP).

The GPP consists of two directions that may be followed sequentially (A and B) or, in the case of A, be a final destination.

- A) Post graduate Diploma of specialty (Masters with thesis)
- B) Ph.D Diploma in Chemistry

A variety of options and specializations is offered and is mostly driven by excellence in research as evidenced by an impressive number of original contributions to knowledge in reputable journals of varying and continuously advancing impact factor. More specifically the masters (with thesis) diploma offers a variety of specializations that seem to offer a diverse array of skills that meet the needs of the local and the national industry.

The cumulative time required for obtaining the undergraduate and master's diplomas is very long by most standards and should be substantially shortened. It is also objectionable that most of the post-graduate students must fully support their education.

Most of the graduates of these degrees are absorbed by the private sector, while a considerable number (about 50%) of the masters graduates proceed toward doctorate degrees within the chemistry department of the university of Ioannina or other Greek and/or international Universities.

Overall, the above account when coupled with the progressively diminishing financial resources of the department offers additional credibility to its faculty and staff.

B. Teaching

APPROACH

The most important principle in the teaching philosophy of the department is to provide basic knowledge of chemistry through core courses in the first three years to be followed with elective courses in the fourth year, and graduate courses in the masters program.

- *Teaching methods used, course updates, student participation, grades, and average duration for the undergraduate degree*

Teaching methods employ the traditional classroom techniques. Some evidence for state of the art tools that include laptops and projection facilities and also a departmental website was available. Unfortunately the committee was not able to see this first-hand, due to the student takeover of the department. The updates for elective and masters courses are performed annually. The average undergraduate degree is 6.53 out of 10 (based on a sample of 432) and the average duration for the completion of the undergraduate degree is approximately 6.0 years based on data reported at the oral presentation of the

undergraduate program. For the period 2002-2006 (typical percentages for graduation in 6 years are 25% and in 7 years 14% as reported in the internal evaluation report for the period of 2002-2008. The extended length of time towards graduation would jeopardize the possible employment opportunities.

The content of the courses was updated through a recent critical assessment of the teaching program (vide infra). Faculty members of the Chemistry Department have translated popular modern textbooks in several core areas. Some of these books are used in other academic institutions in Greece. We became aware of facilities and activities like wireless internet, video recording of lectures and their use in webinars and the availability of course lecture notes, homework assignments and problem solutions. Unfortunately, the unequivocal verification of these events was not possible due to the student takeover.

- *Teaching staff/ student ratio, interactions of faculty and students, and faculty teaching hours per week*

The teaching staff/student ratio for course work is quite favorable (1/8.7) approximately based on data provided at the oral presentation of the undergraduate program for the period of 2004-2009 during the visit. The teaching staff for course work consists of 54 faculty members. The teaching staff members for course work and laboratory work are available to the students.

Teacher/student collaboration

According to the interview with the students, this collaboration is highly satisfactory.

- *Adequacy of means and infrastructure resources*

The 20 year old Chemistry department is very well preserved and has impressive facilities that are regarded as state of the art based on international standards. Both the classrooms and the teaching laboratories are properly equipped, are quite spacious, and can accommodate future faculty additions. We were unable to determine if facilities for wireless internet access were available due to a student takeover of the department on the 13th of September 2011. Similarly we were unable to determine the presence or absence of a computational facility.

- *Examination system and assessment of course work by the students*

Multiple methods of assessing students are applied: assessing the performance of students in each class is carried out through written, or written plus interim exams at the discretion of the instructor. There is a student questionnaire for the assessment of the quality of each course. This is not required and its completion at desirable levels must be improved.

IMPLEMENTATION

- *Quality of teaching procedures*

The teaching methods are highly commended and this reflects, the experience, dedication and excellence of the teaching staff. It was also pointed out unanimously during the interview with master students. Due to the student takeover of the department interviews with undergraduate students were not possible. On the basis of the available interview data the quality of teaching is regarded as high.

- *Quality and adequacy of teaching materials and resources.*

The teaching material and resources are appropriate, updated frequently with international standards, and serve well the departmental mission for excellence.

- *Quality of course material. Is it brought up to date?*

The lectures in most courses are revisited and updated, the quality of the course material generally is regarded as high. The new undergraduate program demonstrates the revision of the teaching program.

- *Linking of research with teaching*

During the fourth year of undergraduate studies, the students are exposed to research through the dissertation. The students have a formal option to join a research laboratory for research which is given credit as a course.

Also, industrial practical activity and experience in applied research is available to students.

Mobility of academic staff and students

The department has numerous collaborations with academic and research institutions within Greece and abroad, and the programs SOCRATES/ERASMUS etc had participation by faculty members and students. These efforts are encouraged to be maintained in the future.

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

The evaluation of the faculty and course structure by students during the interview was very positive on both aspects. The formal evaluation process through a questionnaire presented to the students, in a hard copy form, at the end of each course could benefit from a more systematic process that will be done via access to a secure internet university site at which each student will provide his/her comments anonymously. In addition provisions can be made that will assure a high degree of student participation in these surveys.

RESULTS

- *Efficacy of teaching*

(see above in the APPROACH and IMPLEMENTATION sections)

- *Discrepancies in the success/failure percentage between courses and how they are justified.*

Based on Tables of the Internal Assessment Report, we consider that there are no major discrepancies.

- *Differences between students in (a) the time to graduation, and (b) final degree grades*

(see above in the APPROACH section)

- *Whether the Department understands the reasons of such positive or negative results?*

Based on extensive discussion with faculty members and instructors, they are fully aware of their strengths. They also recognize the challenges that certain students face when they need to work so as to support their academic studies. It appears that the faculty try to accommodate the needs of such students and encourage them to complete their studies. This is a vital issue for a fraction of undergraduates and for the vast majority of graduate students who pursue their degree without receiving any fellowship or teaching assistant stipend support.

IMPROVEMENT

- *Does the Department propose methods and ways for improvement?*

Even though the Chemistry department is in an excellent position in regard to the teaching

component (see aforementioned discussion), the faculty members and teaching laboratory personnel are eager to introduce the most modern teaching methods and tools. They also aim at maintaining the very good teaching staff/student ratios and at improving the interactions among faculty, undergraduate and graduate students.

- *What initiatives does it take in this direction?*

The new undergraduate program of studies for 2011, which was created after a re-evaluation of the previous program has targets that are well defined and accurate. They address the elimination of material overlap, a better organization of the teaching material, the incorporation of recent discoveries in chemistry, a reduction in the number of courses taught (without weakening of the program) and the introduction of the diploma thesis as a basic educational element. These are all excellent changes in the future teaching program of the department.

The availability of a faculty advisor system where each faculty member is assigned to a number of students is not available and is recommended. Also it was not clear whether a web site, that provides all relevant teaching material and student guidance throughout the duration of their studies is available. An improved use of the web as well as the setup of an adequate computational laboratory is needed and will enhance the operation of the department.

Towards improving the quality and conditions of graduate studies at the masters level, the admitted students need to receive fellowships or teaching assistantships that will alleviate the financial issue and allow them to participate in both teaching and research. This is not a direction that the department can address in its totality, and requires the attention and consistent action of the ministry of education.

C. Research

APPROACH

- *What is the Department's policy and main objective in research?*

The research in the department is carried out currently by 54 Faculty Members (Professors, P; Associate Professors, AP; Assistant Professors, AsP; Lecturers, L) in seven areas and their corresponding research laboratories: Inorganic (2; 3; 2; 0); Analytical Chemistry (1; 2; 2; 2); Organic Chemistry (3; 6; 0; 2); Biochemistry (4; 3; 1; 0); Industrial Chemistry (1; 1; 3; 1); Food Chemistry (1; 4; 2; 1); and Physical Chemistry (3; 2; 2; 0).

The department offers masters and doctoral degrees.

The masters program consists of six major research directions in addition to four directions offered through interdepartmental initiatives. The six intra-departmental masters focus on (a) clinical biochemistry and immunochemistry-microbial biotechnology; (b) chemical, environmental and computational technologies-simulations; (c) materials/polymer chemistry; (d) food science and technology; (e) analytical methods and applications; and (f) new technologies of chemical education. The four inter-departmental masters focus on (i) biotechnology; (ii) agro-chemistry and their biological applications; (iii) bioinorganic chemistry; and (iv) food science and nutrition. For the period of 2003-2010, a total of 229 masters were completed through the six intra-departmental directions.

The doctoral program is centered on the seven aforementioned research areas, and during the period of 2003-2010, a total of 145 Ph.D.s' were awarded.

The enthusiasm, perseverance, and dedication to excellence in research was evident throughout the presentations of research activities, interviews, and laboratory visits.

The Department carries out research in the seven aforementioned research areas/labs and on a number of diverse topics that include: (1) Biomimetics; (2) Inorganic & Molecular Materials; (3) Catalysis; (4) Computational Inorganic Chemistry; (1-4: Inorganic Chemistry Laboratory); (5) Environmental Analytical Chemistry & Technology; (6) Electroanalysis & Sensors; (7) Bioanalytical Chemistry; (8) Supramolecular Chemistry; (9) Materials in Analytical Chemistry; (10) Chemometrics; (5-10: Analytical Chemistry Laboratory); (11) Organic Synthesis, Mechanistic Studies, and Spectroscopic Characterization; (12) NMR based Structural Biology; (13) NMR Applications in Natural Product Analysis; (14) Biomedical Chemistry; (11-14: Organic Chemistry Laboratory); (15) Microbial Biochemistry & Biotechnology; (16) Lipids and Biological Membranes; (17) Enzymology & Enzymatic Biotechnology; (18) Peptide & Protein Chemistry; (19) Athero Thrombosis; (20) Bioactive Lipids & Athero Sclerosis; (15-20: Biochemistry Laboratory); (21) Heterogeneous Catalysis & Photocatalysis; (22) Adsorption & Adsorptive Materials; (23) Heterogeneous Non-Catalytic Processes; (24) Hybrid Silica-Poly Acids Systems; (25) Bioceramic Materials; (21-25: Industrial Chemistry Laboratory); (26) Indirect & Direct Food Additives; (27) Plastics Packaging Materials; (28) Inertness Testing of Recycle Packaging; (29) Food Properties; (30) Enzymes in Dairy Technology; (31) Analysis of Wine Composition; (32) Food Microbiology; (33) Food Safety, Preservation & Hygiene; (34) Properties of vegetable oils and triglycerides; (35) Alcoholic Fermentation; (36) Solvents in Packaging Materials; (37) Physicochemical Parameters of Flexible Packaging Materials; (26-37: Food Chemistry Laboratory); (38) Statistical Thermodynamics Methods for Polymer Chains and Star Polymers; (39) Co-polymers, Surface Effects, Polymer Mixtures; (40) Quantum Chemical Studies of Adiabatic and Nonadiabatic Systems; (41) Quantum Chemical Applications for the Prediction of Molecular and Thermodynamic Properties; (42) Computational Studies of Reaction Constants via RRKM Theory, Semi-Classical Approaches, and Transition State Theory; (43) Computational Spectroscopic Studies; (44) Simulations of Chemical and Catalytic Activities in Zeolites and Polymers; (45) Crystallography & Crystal Engineering; (46) Synthesis and Structure of Metal Organic Frameworks; (47) Intermolecular Interactions in Crystal Structures and their Properties; (48) Brownian Dynamics Simulations of Co-Polymers; (49) Computational Studies of Magnetic Hybrid Materials; and (50) Electron Paramagnetic

Resonance Studies.

- *Has the Department set internal standards for assessing research?*

The department used the common international standards for assessing the published results of research (i.e., number of publications and citations; H index (ISI Web of Science); impact factor of journals); most significant advances, recognition of faculty via domestic and international awards. The department deserves recognition in regard to the very detailed presentation of all aforementioned data for sections, laboratories, groups, and all individual faculty members.

IMPLEMENTATION

- *How does the Department promote and support research?*

The Department provides outstanding laboratory facilities for research and teaching, has established fruitful domestic and international research collaborations, and actively promotes research collaboration with other research institutes in related fields. The Department supports the submission of applications to national and internationally funded projects by the academic staff.

- *Quality and adequacy of research infrastructure and support.*

The department has established very good experimental laboratory facilities for both teaching and research purposes. Typical examples of recent first class acquisitions, housed in the Chemistry Department, are (a) the inter-departmental NMR-500 MHz, and (b) the inter-departmental high resolution Orbitrap based proteomics facility. Current and future research infrastructure urgent needs are for the acquisition of a modern charge coupled device or area detector diffractometer. Furthermore, there is a dire need for proper maintenance and technical personnel support of the existing experimental facilities which serve intra and inter-departmental teaching and research needs.

Scientific publications

According to the Internal Assessment Report and the presentations, during the period 1978-2010 there is a total of 1940 papers in peer reviewed academic journals. For the period of 2005-2009, 702 publications are reported, with 7524 citations. For the period of 1996-2010 there are 18,753 citations. According to ISI Web of Science (as of September 8, 2011; unrestricted time period), the Professors of the department had an average H-Index of 19.3, the Associate Professors had an average H-Index of 13.9, the Assistant Professors had an average H-Index of 7.4, and the Lectures had an average H-index of 10.3.

- *Research projects*

According to the funding record presented during the visit for the period 2004-2010, we can observe that the funding success of competitive proposals exhibited a non-monotonic trend reflected through 820K Euros in 2004, 1453K Euros in 2005; 919K Euros in 2006, 740K Euros in 2007, 103K Euros in 2008, 528K Euros in 2009, and 914K Euros in 2010. Such a trend can become worrisome and needs proper attention. To enhance the level of funding so as to reach an adequate and stable level, requires (a) regular calls for proposals by the ministry of education and the General Secretariat of Research and Technology followed by submission of proposals, (b) submission of proposals to all appropriate calls for proposals of the European Union, and (c) proper success rates in the (a) and (b).

- *Research collaborations*

The department has established numerous research collaborations with domestic and international academic and research institutions. The internal evaluation report and the presentations given during the visit provides an extensive list of collaborating institutions.

RESULTS

- *How successfully were the Department's research objectives implemented?*

The overall departmental objective of excellence in research is well attained. Strengths are reflected in the Inorganic Chemistry (average H-Index=18.7), Analytical Chemistry (average H-Index=17), and Organic Chemistry (average H-Index=14.8).

- *Scientific publications*

(see comments in the IMPLEMENTATION section)

- *Research projects*

(see comments in the IMPLEMENTATION section)

- *Research collaborations*

(see comments in the IMPLEMENTATION section)

- *Efficacy of research work. Applied results and patents*

There is potential for a number of patents resulting from the research work. An improvement could take place by establishing a patent office and a technology transfer office with the proper support. Their presence could benefit the results of research work.

- *Is the Department's research acknowledged and visible outside the Department? Rewards and awards.*

There are faculty members with modest recognition reflected in awards and publications in high visibility journals. This is an area that needs attention and could be improved.

IMPROVEMENT

- *Improvements in research proposed by the Department, if necessary.*

The Departmental suggestions for improving the research activities are:

- better utilization of space allotted for research efforts
- adequate funding for acquisition of instructional equipment in the classrooms
- adequate funding for maintenance and technical personnel support of experimental intra and inter-departmental facilities
- additional faculty positions especially at entry positions (Lecturer, Assistant Professor)
- funding for a modern charge coupled device or area detector diffractometer to serve inter-departmental research needs

- *Initiatives in this direction undertaken by the Department*

Some of the aforementioned improvements rely primarily upon the support by the ministry of education, the regional sector, as well as funding from the European Union.

D. All Other Services

APPROACH

- *How does the Department view the various services provided to the members of the academic community (teaching staff, students).*

Several students live within the campus of the UoI and therefore have no transportation difficulties in reaching the labs. In addition the monthly pass is relatively inexpensive compared to the main city universities (Thessaloniki, Heraklion, Athens).

The effectiveness of administrative and technical services is good to excellent. However it should be taken into consideration that due to general strike at the UoI during our visit it was not possible to talk to representatives of the administrative staff except the rector and the vice rector.

When compared to other countries the current chemistry community in the department of chemistry at the UoI appears to have a large proportion of satisfied staff members.

The library, when judged by international standards (European and US), is well equipped with books, electronic communication, access and apparently a highly skilled and dedicated staff. Importantly, the library is open 7 days a week!

The panel members did notice understaffed technical service (see part C). However the unusual enthusiasm of the existing technical staff is refreshing and worth noting.

- *Does the Department have a policy to simplify administrative procedures? Are most procedures processed electronically?*

It seems that things are working well considering the limited number of personnel.

- *Does the Department have a policy to increase student presence on Campus?*

No information was available.

IMPLEMENTATION

- *Organization and infrastructure of the Department's administration (e.g. secretariat of the Department).*

-

Due to a takeover at the UoI during our visit it was not possible to obtain information on this issue.

Unfortunately, although urgently needed there is no a glassware technician.

- *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 library is well organized (see above) and there is also a cafeteria and a restaurant for the UoI including the chemistry students. It was not clear that free internet access is available in all labs in the Department. Similarly the on-line access to journals from home is not clearly evident.

RESULTS

- *Are administrative and other services adequate and functional?*

Yes, it is adequate and functional. The activities and dedication of the rector and the vice rector are impressive and refreshing.

- *How does the Department view the particular results.*

The Department is aware of the problems concerning both the students and staff

IMPROVEMENTS

- *Has the Department identified ways and methods to improve the services provided?*

The provided services are quite satisfactory (see above). There is a university subsidized housing facility as highlighted by the rector.

Importantly (as also in other Greek chemistry departments), the EEC met a lot of interested, clever and ambitious young students with a clear wish to do well and exploit their talents to the best advantage. However many of them stated that the Ph.D. degree from the University of Ioannina, though it is considered far better to those obtained by the main city universities of Athens and Thessaloniki, there is no guarantee for opportunities in industry, and that it might even be a dead-end option.

- *Initiatives undertaken in this direction*

No information was available

Collaboration with social, cultural and production organizations

No information was available.

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

- *Potential inhibiting factors at State, Institutional and Departmental level, and proposals on ways to overcome them*

As observed at other university chemistry departments in Greece, the inhibiting factors at the state level are (a) the lack of frequent funding cycles and support from the ministry of education; (b) the almost non-existing funding and support from the General Secretariat of Research and Technology; (c) the lack of fellowships and/or teaching assistantships for the masters and doctoral programs; and (d) the increased competitive level for external funding.

The potential inhibiting factors at the institutional level are (a) the reduced support of funds for the departmental operational expenses; (b) the claimed lack of space for accommodating the Organic Chemistry Laboratory for both teaching and research; (c) the lack of a modern inter-departmental crystallographic facility; and (d) the lack of funds for the purchasing of consumable supplies and for the cost of major instrument repairs.

The potential inhibiting factors at the departmental level are (a) the relatively slow growth of interest in the biological directions of inorganic chemistry; (b) the lack of proper maintenance and technical personnel support of the experimental facilities; (c) the excessive debate and reservations on the value of the internal and external assessments; (d) the questionable level of collegiality in the Physical Chemistry section and its overall potential impact in the departmental moral; and (e) the lack of recognition mechanisms (e.g., departmental awards) for exceptional contributions in teaching and research.

Specific suggestions to address the aforementioned inhibiting factors are:

1. The Siemens P4 Diffractometer available to the department is antiquated. It is imperative that a state of the art diffractometer with a Charge Coupled Device (CCD) or at least an area detector technology be acquired. The need for modern X-ray instrumentation in a good chemistry department that is also available to inter-departmental use cannot be overemphasized.
2. Encourage a shift in the teaching and research directions to chemical biology, catalysis and materials chemistry.
3. There is available research space in buildings X2 and X3 to accommodate the organic chemistry. A reorganization of space is needed and should be carried out to achieve this.
4. Introduce transparent metrics, based on documented departmental excellence, for the distribution of funds at the institutional and state level.
5. Institute fellowships and teaching assistantships at the masters and doctoral levels.
6. Initiate and sustain regular cycles of funding mechanisms from the ministry of education and the General Secretariat of Research and technology.
7. Establish and coordinate intra- and inter-departmental research proposals for competitive external funding opportunities so as to promote the creation of internationally recognized centers of excellence.
8. Introduce meritocracy and excellence-based ranking for the faculty in the department of chemistry. Reward the top faculty and particularly the younger of those highly ranked.

The external evaluation committee is in agreement with the short-term, medium-term and long-term goals presented by the department of Chemistry.

F. Final Conclusions and recommendations of the EEC

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 external evaluation aims at enhancing the existing knowledge base that could be used for identifying future priorities for initiatives in research and teaching.

In spite of the present adversity in funding by the state, the chemistry department of the University of Ioannina has established a very good quality research and teaching program.

- Most faculty members have active research programs. The senior faculty maintain a respectable international research program, and it is also gratifying to observe that most of the younger faculty members appear to lead vibrant research initiatives.
- Most faculty members pursue creative and modern teaching initiatives as is apparent in the revised curricula.
- The best Ph.D. graduates are sought after for postdoctoral positions nationally and abroad, and some of them follow academic careers at domestic universities.
- The existing building facilities, experimental laboratories space for teaching and research, the classrooms, and the office space are appropriate. Due to the student takeover of the chemistry building it was difficult to determine the availability of the electronic, internet, or communications infrastructure.
- While the existing experimental infrastructure appears generally satisfactory in most areas of chemistry there is a real need for a state of the art crystallographic instrumentation.

The external evaluation committee has the following recommendations:

- The research directions of modern chemistry departments currently are heavily influenced by chemical catalysis, chemical biology and materials chemistry. In the chemistry department of the university of Ioannina the existing modest efforts in these directions must be enhanced.
 - Any departing faculty should be replaced by faculty with interests and training as stated above.
 - Pursue intra- and inter-departmental collaborative research efforts (e.g., Biology, Medicine, Materials) that follow the new directions.
 - Acquire through institutional support and other funding sources X-ray diffraction equipment with provisions for appropriate space and technical support.
 - Establish funding mechanisms at the institutional level that support start-up packages for new hires and retention of senior faculty.
 - The state should establish funding sources for fellowships and teaching assistantships for masters and doctoral students.
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- *the Department's readiness and capability to change/improve*

The expressed reservations about the external review apparent in the internal review and also in oral presentations suggest that certain members of the department may not be in agreement with external suggestions. It must be emphasized, nevertheless, that the majority of the members of the Chemistry Department are aware of the current and future needs and have themselves proposed many of the aforementioned suggestions for improvement as evidenced in the internal evaluation report and during the site visit.

- *the Department's quality assurance*

The department's quality assurance depends on the continued excellence of the senior faculty and to a greater extent to the growth, recognition, and success of the younger faculty. The vibrant younger researchers represent the future of the department.

The Members of the Committee

Name and Surname

Signature

1. Professor Demetrios Coucouvanis _____
2. Professor Dimitris S. Argyropoulos _____
3. Professor Christodoulos A. Floudas _____
4. Professor Athanassios Giannis _____