ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Α. ΔΙ. Π.
ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ ΠΟΙΟΤΗΤΑΣ
ΑΝΩΤΑΤΗΣ ΕΚΠΑΙΔΕΥΣΗΣ

HELLENIC REPUBLIC
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HELLENIC QUALITY ASSURANCE AGENCY
FOR HIGHER EDUCATION

EXTERNAL EVALUATION REPORT

MATERIALS SCIENCE ENGINEERING DEPARTMENT

UNIVERSITY OF IOANNINA

September 2011

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External Evaluation Committee

The Committee responsible for the External Evaluation of the Materials Science Engineering Department of the University/Technical Institution of Ioannina consisted of the following five (5) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005 :

1. Professor Athanassios Z. Panagiotopoulos (Coordinator)
   (Title) (Name and Surname)

   Princeton University, USA
   (Institution of origin)

2. Professor Manos Mavrikakis
   (Title) (Name and Surname)

   University of Wisconsin-Madison, USA
   (Institution of origin)

3. Professor Theodore Moustakas
   (Title) (Name and Surname)

   Boston University, USA
   (Institution of origin)

4. Professor Eleftherios Papoutsakis
   (Title) (Name and Surname)

   University of Delaware, USA
   (Institution of origin)

5. Dr. Alexis Stassinopoulos
   (Title) (Name and Surname)

   Assoc. of Manufucturers of Packaging and Materials, Athens, Greece
   (Institution of origin)

Introduction

I. The External Evaluation Procedure

The committee was on site at the University of Ioannina (UoI) September 5-7, 2011.

On Sept. 5th, the committee met with the Rector of UoI, Prof. T. Albanis, vice-Rector, Prof. George Kapsalis, the Chair of the Department of Materials Science Engineering (DMSE), Prof. A. Avgeropoulos, as well as other members of the departmental Internal Evaluation Committee (IEC).

On Sept. 6th, the committee attended presentations on the undergraduate and graduate programs, research activities of the individual laboratories, and the internship program. The committee also met separately with groups of lecturers, assistant, associate and full professors of the department. The committee was pleased to see that a large majority of departmental faculty were there for the presentations and participated in the group discussions.

On Sept. 7th, the committee visited the central university library and dining hall facilities, and met separately with groups of (a) technical and support staff, (b) undergraduate students, (c) M. Sc.-level graduate students, (d) PhD-level graduate and postdoctoral students. The committee was unable to visit the physical facilities of the department due to a student and administrative staff occupation (κατάληψη). However, the facilities were extensively described and discussed. At the end of the visit, the committee met again with Rector Albanis, vice-Rector Kapsalis and Chair Avgeropoulos.

The committee was provided with copies of the IEC reports, the departmental Study Guide (Οδηγό Σπουδών), lists of textbooks used in courses, copies of all presentations, data on grants, instrumentation, building facilities, research and other expenditures, and information on the current position of about 80 students who have graduated from the department in recent years.

II. The Internal Evaluation Procedure

The IEC reports of 2008-09 and 2009-10, as well as the Yearly Update (Ετήσια Απογραφική Έκθεση) dated Dec. 23, 2010 were based on extensive data provided by the departmental faculty and staff, and external bibliographic databases such as ISI's Web of Science and Scopus. Clear, extensive up-to-date documentation was provided on undergraduate and graduate curricula, teaching and research activities for each departmental faculty, administrative services, facilities, and plans for improvement.

The objectives of the internal evaluation process were fully met. The report and accompanying material was thorough, up-to-date and clearly demonstrated a strong commitment by the department to the evaluation processes.

□. *Curriculum*

A1. APPROACH

UNDERGRADUATE PROGRAM

The goals and objectives of the Curriculum are to prepare students to become a Materials Science Engineer, which was defined by the Department is an Engineer who, "by combining the basic principles of physics, chemistry, mathematics, and technical as well as economics science, designs and develops processes and facilities for the synthesis and the treatment of materials according to the most appropriate technical, environmental, cheap and socially approved manner". Thus, the curriculum is shaped by the above definition, and uses internationally accepted courses to achieve that goal. The curriculum was developed as a 5-year Engineering curriculum based on well-established programs, in Greece, other European, and North American countries. These courses include lecture and laboratory work, a well-developed Diploma Thesis program, and organized opportunities for practical training outside the University setting (an internship program). The curriculum is rich in educational opportunities and attends to the needs of the profession and the society.

The curriculum evolved substantially since the formation of the department, and uses internationally accepted course contents to attain the goals of educating the students in the subjects included in the definition of the Materials Science Engineer. While not explicitly stated, the curriculum was developed by the faculty and staff in the department, and is continuously improved and adapted to meet the needs of the evolving sciences and technology. It became clear from our meetings with the various groups of faculty and staff that all stakeholders are involved in this process. It was also clear that students were happy with the current curriculum, which they have many opportunities to evaluate. It is interesting to note that students and staff are also engaged in the process of explaining the curriculum to outside stakeholders (notably scientists and staff in the private industry and governmental labs) through the internship program. This is commendable.

The department has set a thorough process for curriculum revisions, as was explained by the department chair and summarized in a slide under the title "Reform of the Undergraduate Studies Program". As stated, "a faculty committee appointed each year is responsible for any changes in the undergraduate studies program". The revision process was judged as thorough and effective anticipating changes in the Higher Education law.

GRADUATE PROGRAM (M. Sc.)

For the M.Sc. program, the curriculum is based on the stated goal of the program, namely "the training of Scientists and Engineers with specialty in Chemistry and Technology of Materials, so that those who accomplish their studies attain a very strong background, experience, and expertise in the modern science and technology of materials, especially in the ways of synthesis, characterization and applications of various materials such as: ceramics, polymers, metals and composites". There are about 10 courses (at least 40 hours each) designed to attend to the needs of the M. Sc.

Program. Students choose among these courses to fulfill the requirement for 60 ECTS in two semesters of the 1st year of their studies. Furthermore, the students must carry out research for writing an M. Sc. thesis. Finally, the course work is enriched by occasional seminars engaging scientists both from Greece and abroad. The program and the course content take into account the broad spectrum of prior educational experience and training of students in the M. Sc. Program. Students come with degrees in chemistry, chemical, mechanical, civil or environmental engineering or physics. Organization and revision of the courses and their content is as in the Undergraduate Program.

DOCTORAL (PhD) PROGRAM

The PhD program aims to "to provide an environment for individuals to develop the skills to become leaders in scientific research and education, capable of making original contributions to the advancement of material science, materials engineering and related disciplines", and is offered through two options/approaches. A. Through the Department's Graduate Studies program; and B. Directly from DMSE. For option A, if a student holds an M. Sc. Degree in Natural or Applied Sciences, no formal courses are required. Otherwise, the students must take 10 courses as in the M. Sc. Program above. There is set process for defining the PhD-thesis topic through an Advisory Committee, and the requirement for defending the PhD thesis in front of a Final Examination committee made up of 7 faculty members. For option B, which is available to students either with a DMSE degree or a M. Sc. in Natural or Applied Sciences, there are no formal course requirements. Definition of the thesis topic, annual progress reports and final thesis defense in front of a 7-member Advisory committee complete the program requirements. These requirements for both options are consistent with international PhD programs in the field.

A2. IMPLEMENTATION

UNDERGRADUATE PROGRAM

The course content and the curriculum overall appear to have been successfully implemented. The curriculum is coherent and functional. This assessment is based on the course descriptions made available to the EEC, but also on interviews with a group of undergraduate students. The students were satisfied with the process for the research and preparation of the Diploma thesis. This curriculum compares very favorably with curricula in top programs in the US and Europe, except possibly with respect to the rather large number of courses taken by the students. There are no other comparable (5-year) programs of study in Materials Science and Engineering in Greece.

The curriculum in both logically organized and clearly articulated. It offers solid foundation for the goals of the program, as well an unusually rich set of specialty and advanced courses.

As far as the committee could assess, based on the Studies Guide and the interviews with the students, the material for each course is appropriate and the times offered sufficient.

The department faculty and staff offer exceptional resources, both in numbers and expertise for implementing (and have successfully implemented) the curriculum.

GRADUATE PROGRAMS (M. Sc. and PhD)

The same comments apply exactly as for the UNDERGRADUATE PROGRAM above.

The M. Sc. students were very pleased with both the course offerings (content, material, teaching) and the research opportunities for the M.Sc.-thesis preparation. The PhD Students were also pleased with the broad and rich research opportunities, as well the well instrumented and supported research facilities for the PhD-thesis preparation.

A3. RECOMMENDATIONS

UNDERGRADUATE PROGRAM

1. The committee feels that, compared to top programs in Europe and the USA, the curriculum is somewhat excessive in the number of courses, both required and electives. The number of courses that students take should be reduced, in order to allow more in-depth coverage and better retention of the information. The Department understands this issue, and can act to deal with it after examining possible constraints deriving from rules of the University, the Ministry of Education or other agencies.
2. A small number of existing courses seem to be only tangentially relevant to materials engineering (e.g., Mechanical Drawing I and II) and could possibly be eliminated from the curriculum. There are also overlaps, especially among specialty courses, that should be minimized.

GRADUATE PROGRAMS

1. We recommend that a regular, department-wide Seminar series be implemented to attend to the needs of both the M. Sc. and PhD programs. We feel that the department understands this as an area of improvement and can readily carry out its implementation, assuming some financial resources to pay for travel expenses and honoraria for the seminar speakers.
2. The committee also feels that the department should strengthen the informal scientific interactions among students, faculty and staff of the large number of research groups and research sections within the department. This could include joint group meetings, cross-group journal clubs, an internal seminar series, whereby M. Sc. and PhD students present their research on a rotating basis, and an annual poster symposium with awards. This is a need that appears to be recognized by graduate/PhD students and by several faculty and staff members, and can be readily implemented.

B. Teaching

B1. APPROACH

The teaching philosophy of the department is to educate students with the theoretical and practical knowledge required for the study of synthesis, structure, properties, process and products based on a variety of materials families. This approach is generally used in all three levels of the department's mission (undergraduate, post-graduate and doctoral programs)

This five-year program consists of 48 required courses and 14 elective courses. The teaching methods include traditional lectures presented either on the blackboard or in the form of PowerPoint presentations. The lectures are supplemented by laboratory practice. A summary of course description is given in the "Study Guide." The last semester of the program is dedicated to the diploma thesis.

The total number of undergraduate students is 737 and the number of faculty 26. Thus the nominal ratio of students to faculty is > 28. Since the number of the teaching staff is 32 the ratio of students to teaching staff is >23. However, not all students are active, so the actual ratios are lower. The students who met with the committee unanimously expressed satisfaction with the availability of their teachers in and out of classroom.

The laboratory facilities are well maintained by trained technical personnel. All of the technical staff has degrees of higher education in science or engineering, and some have even graduate degrees (MS and PhD). The committee met with the technical staff and was impressed by the diversity of talents and dedication to their assignments.

There are 2 computer laboratories, which are also used as study areas for students and for internet literature search. There are 3 classrooms in the Administration Building with capacity of 100, 80 and 40 persons and 2 classrooms in the Engineering Building with 70-person capacity each.

The use of internet resources amongst faculty and students is extensive. This includes well-maintained computer facilities as well an extensive library with many books and periodicals both in printed and electronic forms.

The students are graded based on their examination at the end of each semester. A number of students choose to take one or two mid-term exams to earn approximately 30 % of their final grade.

B2. IMPLEMENTATION

In addition to input from the faculty, the committee met with a number of undergraduate, postgraduate and doctoral students, who expressed their enthusiasm about the teaching procedures employed by their teachers.

The committee felt that the teaching materials and resources are constantly updated to meet the department's mission. The course material is revised and updated periodically. Recent major revisions were made to increase the engineering content of the curriculum.

All of the students are linked to the Department's research though their Diploma thesis. 95 students have completed their thesis prior to 2005, and 278 students from 2006-2010. Similarly, 109 graduate students and 144 doctoral students have participated in research in carrying out their MS and PhD studies.

Faculty members have extensive collaborations both with institutions in Greece and abroad. The department encourages students to participate in the European program

"Life-long Learning (LLP)/ Erasmus and has established collaborations with Université de Poitiers/École Nationale Supérieure de Mécanique et d'Aérotechnique (ENSMA), France, Universitá di Calabria, Cosenza, Italy, Universidad del Pais Vasco, San Sebastian, Spain, and the University of Łódz in Poland.

Due to the strong chemical background of DMSE's courses, some students are also taking advantage of LLP collaborations of the Department of Chemistry (in collaboration with the departmental coordinators of DMSE), such as with Universidad Autonoma de Madrid, Spain, Institute of Chemical Technology-Prague, Czech Republic and University of La Coruña, Spain.

The numerical evaluation of the instructors for the mandatory courses, based on student questionnaires is 3.8 and for the elective courses is 4.2. The numerical scores for the mandatory courses were 3.5 out 5, and for the elective courses 4 out of 5. Consistent with these evaluations, during the interview the students spoke with enthusiasm about the dedication and availability of the teaching staff.

An internship program, supported by external funds, places students in their last two years of undergraduate studies with companies and other organizations throughout Greece. An adequate number of positions are available (about 70 in the past year), so that most students applying for an internship can secure one. The program monitors the level of satisfaction of students and supervisors and takes corrective action for any issues that come up. The vast majority of student participants evaluate their experience as highly positive.

B3. RESULTS

As discussed in the previous sections, teaching in the Department is done in a methodical way using established teaching approaches. The synergy between classroom and laboratory teaching produces students with strong background in the various aspects of materials science engineering.

Based on the data presented to the committee by the Department, 3% of the students are graduating within 5 years, 54% within 6 years, 25% within 7 years, 13% within 8 years and 5% within 9 years. It should be pointed out that these data are systematically skewed by the assignment of students finishing in September of an academic year to the following year's cohort.

B4. SUMMARY AND RECOMMENDATIONS

SUMMARY

1. The department succeeds in training a large number of undergraduate students, even though their educational background at initial enrollment is often weak, as indicated by the relatively low admission grades of incoming students. The majority of the students complete the program within a reasonable amount time, reflecting the dedication of departmental faculty and staff.
2. Student evaluations of teaching are very positive.
3. An appropriate range of teaching methods is being used.
4. Evaluation of student learning takes place both during and at the end of the semester, by means of midterm tests and final exams.

5. Students in difficulty are offered opportunities to master the material and improve their chances of attaining a passing grade through problem set assignments.
6. The external internship program is extremely well structured and offers excellent training opportunities to students in the last two years of studies.

RECOMMENDATIONS

1. The educational experience of the students can be significantly improved by lowering the number of incoming undergraduates. This will likely also raise the average quality of incoming students.
2. The department is making an effort to reduce the average time for graduation from 6.33 years to 6 years. This includes tutoring of students whose graduation was delayed. This effort is highly commendable and should be continued.
3. The Department has committees in charge of changes to the undergraduate studies program. These committees are also addressing issues related to the anticipated changes in the Higher Education system. This process is important and should be maintained.

C. Research

C1. APPROACH

Research is performed at all three levels: (1) undergraduate, through the execution of the diploma thesis by each student; (2) Masters students pursuing their thesis; (3) PhD students conducting research for their doctoral thesis.

The main objective in research is to promote the generation of new knowledge and, in doing so, to train students (undergraduate, MS, and PhD) towards performing independent and original research. In addition, the department pursues dissemination of this knowledge through publications in the peer-reviewed, archival literature.

The department promotes quality (versus quantity) of research output. On average, each PhD thesis produces 2-3 scientific papers in respected scientific journals.

Quality of research is assessed internally through the establishment and active engagement of committees overseeing and conducting the respective final examinations: (1) Diploma theses (3-member committee), (2) MS theses (3-member committee), and (3) PhD theses (7-member committee).

Presentations by the faculty have clearly demonstrated that internationally accepted research quality metrics, including h-factor and citations per faculty, are monitored systematically, and reported in the Internal Evaluation Report thoroughly, suggesting that DMSE maintains the appropriate standards for assessing its research output and productivity.

C2. IMPLEMENTATION

DMSE is a highly research-oriented organization. Faculty is very active with writing competitive grants in response to calls for proposals by both EU and National funding agencies. In addition, direct contracts with industry provided an avenue for more applied research. It is noteworthy that there is a clear upward trend over the last several years indicating that DMSE faculty leads, rather than participates, in fund-raising activities.

Research infrastructure appears to be well established and among the best in the world (e.g.: the UoI central NMR facility used by researchers in the department). Others, like the Scientific Computing Laboratory, although adequate for now, may not be comparable to major scientific computing centers in the EU or other advanced countries. Technical support for scientific equipment is provided by well-qualified and suitably trained personnel.

DMSE faculty is engaged in an impressive list of research projects addressing various aspects of design, synthesis, development, characterization and testing of novel materials and devices. Given the diverse background of DMSE faculty (e.g.: chemists, physicists, chemical, electrical, metallurgical, and mechanical engineers, mathematicians), the approach implemented to address scientific and engineering problems is truly multidisciplinary in nature.

Research productivity is mainly reflected in ~80 peer-reviewed scientific publications per year for the entire faculty, currently consisting of 26 members. These papers are published in

a wide range of archival scientific journals, including Physical Review Letters, Chemistry of Materials, Applied Physics Letters, Surface Science, Journal of Physical Chemistry, Journal of the American Chemical Society, ACS Nano, and Nanoletters.

All departmental sections have active research projects. These cover research areas such as: ceramics and composites, metallurgy, magnetic materials, electronic materials, computational and mathematical modeling, polymers, biomedical engineering, medicinal chemistry, materials mechanics, and smart materials.

Research collaborations are very actively pursued both within the Department, the University, and research groups in other countries. As DMSE has by now established a name for itself, the number of research collaborations between it and other organizations (both with Greek and international partners) are growing at a truly impressive pace.

C3. RESULTS

Faculty teaching load, as required by Greek Law and imposed by the excessive number of undergraduate students admitted to the program, substantially limits the time left for research. Further, as the department is only 12 years old, substantial time of the faculty so far has been spent on building the necessary infrastructure, both for student training and research laboratories. Considering these two limiting factors, the EEC believes that DMSE's research output demonstrates a remarkable level of accomplishment. Provided that the faculty continues and enhances their high level of activity, this infrastructure should allow much higher volume and quality of output in the years to come.

So far, the Department has awarded 26 PhD's and 72 Master's degrees. This research has been funded by ~4.8 million Euros from Public Organizations and ~9.2 million Euros from Competitive Programs, which translates to a healthy return on investment ratio of nearly 2. DMSE faculty has established an exceptional record of success with fund raising compared to the rest of the UoI departments, particularly with grants for major research instrumentation. Notably, several research groups have been very successful with fund raising from industry.

The main research output of the Department is reflected in ~80 peer-reviewed scientific publications per year for the entire faculty. The impact of that work is demonstrated by a total of ~1300 citations per year. In addition to these archival journal publications, the faculty has published a large number of conference proceedings papers and a reasonable number of patents. Unfortunately, the Intellectual Property infrastructure in Greek Universities is nearly non-existent, which makes patent filing and long-term support by faculty impractical. Yet, the Department should be commented for managing to "spin-off" 11 companies from ideas born out of their research labs.

A healthy amount of research collaborations with other Greek and foreign institutions contribute to the research output of the Department. Collaborating institutions include: Cornell University, Harvard U, MIT, Yale U, U of Delaware, LBNL, U of Groningen, UCSB, U of Akron, U of Houston, Eindhoven U of Technology, U of Nottingham, U of Glascow, Imperial College London, Cambridge U, U of Poitiers, U of Oslo, Linkoping U., U of Padova, Cyprus U, Grenoble, and U of Rome.

Currently, research output and international collaborations are the main drivers contributing to name recognition and visibility of the Department. EEC finds this level of accomplishment remarkable, and expects the positive trend in the international visibility of DMSE to be further enhanced.

C4. RECOMMENDATIONS

There is clearly significant room for improvement, mostly on how the University and other factors outside the Department affect faculty's productivity. What follows represents a non-exhaustive list of examples, where things could be improved substantially:

1. It is quite common to utilize research equipment for instruction (e.g.: undergraduate laboratory courses). Given the excessive number of undergraduates admitted to the program, this translates to multiple laboratory sessions, which essentially interrupts research activities depending on this equipment for extensive periods of time. This has a negative impact on research progress by graduate students and slows down research productivity. The EEC wants to recommend strongly that the Greek authorities consider this important factor and consult with the faculty seriously prior to deciding on the numbers of admitted students, or simply provide the necessary funds and building space to decouple research from massive undergraduate training.

2. The UoI Research Committee should seriously consider returning part of the overhead it collects from the impressive fund raising efforts of the Department to the Department in kind (for instance: graduate fellowships). That way, the University can reward success with fund raising and promote research excellence further.

3. Special equipment needs have to be accommodated in a more timely fashion that it is currently the norm. For instance, very tall equipment needs special rooms to be accommodated, and UoI should facilitate the construction of appropriately designed space in a timely way, so that research plans and project commitments can be met in a timely fashion.

D. All Other Services

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

D1. APPROACH

University services to students

The department and the University have a genuine interest in the welfare of their students, and the affordability of their education

University services to the Department

The University appears eager in providing services that would enhance the departmental function and effectiveness.

Services within the Department

The department has set as a high priority to provide good computational and research infrastructure services for students, staff and faculty.

D2. IMPLEMENTATION

University services to students

The committee was impressed by the services offered by the University to the students. These include: exceptional library services and resources available 12 hours a day, 7 days a week; student housing and free food (board) services for those who qualify; medical insurance; and discounted public transportation.

University services to the Department

The committee acknowledges the high-level and quality computational resources and services.

Services within the Department

The committee received positive comments by students and staff regarding the high quality services provided by the computer specialists and technicians in the Department. The committee was particularly impressed by the ability of the computer specialists to re-use and upgrade computer hardware.

D3. RESULTS

The committee did not have an opportunity to assess central administrative services.

Generally, and within structural constrains, the committee felt that the services provided to the students by the University and the department are of high quality, and this was broadly acknowledged.

RECOMMENDATIONS

1. The University should implement a more thorough and safer process for disposing hazardous wastes generated by the research and educational activities of the

department. Currently, it seems that on occasions such waste must be transported to the central collection point of the university by staff members in private cars. This is neither safe nor does it meet accepted international safety procedures.

2. It was brought up to the attention of the committee that the recent central power failures have caused several problems in the operation of critical equipment such as computers and high-end instruments. The department desires to purchase and install their own power generator in order to be able to ameliorate this frequently occurring unfortunate situation, and thus, the committee feels that this request deserves a high priority attention.

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

E1. Potential affiliation with the Technical Chamber of Greece (TEE)

Present situation

The standing main objective of the department over the past several years has been the admission of its graduates as members of TEE. Faculty and students believe that this would greatly upgrade the graduates' professional status and improve their chances for employment and higher salaries. The result of the department's and UoI's efforts along these lines was a law in 2009, according to which the department received its current name. The curriculum was revised to address TEE suggestions and the number of faculty with engineering degrees was increased. However, TEE has not accepted the DMSE graduates as members and the prospects of a successful conclusion of this process seem remote.

Recommendations

EEC recommends that the department focus on its goal of creating a material science and engineering center of excellence, without putting undue emphasis on TEE membership, for the following reasons:

a. The official recognition of the profession of "materials engineer" by the Council of Higher Education (ΣΑΠΕ) should give adequate professional status to the department's graduates. According to the Rector of UoI, the University has already applied to ΣΑΠΕ.

b. The opening of "protected professions" required by EU will soon limit the importance of being a member of TEE.

E2. Student and faculty communication with the outside world

Present situation

Faculty members and, through them, their doctoral students are adequately connected with the network of academic institutions in and outside Greece.

The department has an excellent internship program for the undergraduate students. The EEC was impressed with the efficiency and care by which this program is monitored.

Recommendations

1. Both faculty and students should expand and update their communication tools with

the private sector (industry, construction, services, etc) in Greece. This is the primary potential employment destination for most of the graduates at the level of diploma and M. Sc., and for a considerable fraction of the PhD graduates, given the likely limited number of academic openings in Greek universities in the coming years.

2. Faculty should also open the student horizons (at all levels) regarding potential employment opportunities outside the boundaries of Greece, and prepare them for the challenges likely to be faced in such environments.
3. The excellent existing internship program should offer the option of an expanded-length (e.g., 6 months) stay with the hosting organizations. An appropriately designed extension of the program to graduate students should also be considered.

E3. Departments' visibility

Present situation

A department with such an excellent technological, training and research level deserves a far wider visibility. One factor limiting external visibility is that the vast majority of current graduate students comes from within the department's own undergraduates. Another contributing factor is the relatively small number of broadly attended departmental seminars with high-visibility external speakers. An improved departmental visibility will also likely improve the quality of incoming students at all levels.

Recommendations

1. The department should consider mechanisms to increase the number of students from other Greek universities in its graduate programs.
2. Over a longer time period, the graduate programs of the department can also be made attractive to students from outside of Greece, especially from nearby countries. For this to be realistic, the graduate program needs to be offered in English. The transition should proceed in steps: (1) A pilot program with a few selected courses can be implemented quickly. (2) The department can encourage writing of M. Sc. and PhD theses in English. (3) Eventually, all of the graduate curriculum can be offered in English.
3. The expansion of the occasional seminars currently offered by the department, with addition of external well-known speakers should be considered, recognizing that a modest amount of financial resources will be necessary to support travel and local accommodations for the invited speakers.
4. An increased presence of graduate students at conferences and meetings, both within and outside of Greece, is also highly desirable. Of course, appropriate financial resources will need to be secured for this to be feasible. One possible source of funding might be travel awards from UoI Research Committee, through partial refunds of collected project overhead costs.

E4. Development of a School of Engineering at UoI

Present situation

There is presently no School of Engineering at UoI. A department of Architecture has been approved in principle, but its actual establishment has been delayed. The EEC feels that the potential synergies and interactions between DMSE and Architecture are relatively limited. The department of Biological Applications and Technology at UoI was established at roughly

the same time as DMSE and recently completed its own external evaluation process. However, the Biological Applications and Technology department does not seem to be a good candidate for inclusion in a School of Engineering at UoI, because it does not have sufficient engineering content. Materials is a particularly interdisciplinary area of engineering, and would strongly benefit from increased interactions with other local engineering departments.

Recommendation

The development of a School of Engineering at the University of Ioannina is highly desirable. One possible path for this that the EEC finds attractive will be to make the necessary changes to allow the current Computer Science department at UoI to join DMSE within a School of Engineering. This will offer more potential interactions with DMSE than Architecture. For example, the Section on Medical Technology and Intelligent Information Systems has natural synergies with Computer Science. There is considerable research activity in DMSE related to large-scale computational studies of materials that could also benefit from increased interactions with computer scientists and software engineers.

F. Final Conclusions and recommendations of the EEC

CONCLUSIONS

1. DMSE at UoI was established in 1999. Despite its short history, the department has exceled in teaching and has demonstrated a strong commitment to its students at both graduate and undergraduate levels.
2. The department is very active in a wide range of materials-related research areas and has a strong record of publications and international collaborations.
3. DMSE has managed the successful placement of its graduates. A large fraction of undergraduate and M. Sc. students have continued with higher-level studies within DMSE of UoI. Many PhD graduates are now with academic institutions in Greece and abroad.
4. DMSE has a strong quality assurance process and has adopted procedures for performance monitoring and continuous improvement.
5. A good spirit of teamwork and departmental pride seems to be prevalent among members of the department.
6. Tenure and promotion procedures are seen as fair and reasonably paced.
7. DMSE has had good support over the years by UoI administration in hiring, space, and other resources.
8. DMSE has demonstrated a high degree of leveraging of state funds through winning competitive external awards for infrastructure development and research.

RECOMMENDATIONS

The EEC feels that the following suggestions, if implemented, might further enhance DMSE's potential:

1. The number of entering undergraduate students should be decreased significantly.
2. Partial return of overhead charges should be considered and implemented, possibly in the form of graduate fellowships.
3. The issue of broader context of the department within a School of Engineering at

UoI should be carefully thought out and implemented.

4. The graduate program should become more outward-looking: this should include actively encouraging current students to go elsewhere for graduate work and recruiting graduate students from other Greek universities and from abroad. A path forward towards the goal of attracting foreign students would be implementing teaching of graduate courses in English.
5. PhD candidates and postdoctoral fellows should be encouraged to participate in (a) broader research seminars in a variety of areas and (b) at least one international conference, preferably outside Greece.

The Members of the Committee
Department of Materials Science Engineering
University of Ioannina

Name and Surname	Signature

1. Prof. Athanassios Panagiotopoulos,
   Princeton University, USA

2. Prof. Manos Mavrikakis,
   University of Wisconsin-Madison, USA

3. Prof. Theodore Moustakas,
   Boston University, USA

4. Prof. Eleftherios Papoutsakis,
   University of Delaware, USA

5. Dr. Alexis Stassinopoulos, Expert,
   President of Association of the Greek
   Manufucturers of Packaging and Materials, Greece