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ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC

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HELLENIC QUALITY ASSURANCE AND
ACCREDITATION AGENCY

EXTERNAL EVALUATION REPORT

DEPARTMENT OF ELECTRONICS ENGINEERING

ALEXANDER TECHNOLOGICAL EDUCATIONAL INSTITUTE OF THESSALONIKI

OPERATIONAL PROGRAMME
EDUCATION AND LIFELONG LEARNING
investing in knowledge society
MINISTRY OF EDUCATION & RELIGIOUS AFFAIRS, CULTURE & SPORTS
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External Evaluation Committee

The Committee responsible for the External Evaluation of the Electronics Engineering Department of the Alexander Technological Educational Institute of Thessaloniki consisted of the following five (5) expert evaluators drawn from the Registry constituted by the HQA, in accordance with Law 3374/2005:

1. Dr. Dimitrios Makris
   Reader, Digital Imaging Research Centre, School of Computing and Information Systems
   Faculty of Science, Engineering and Computing, Kingston University, UK

2. Dr. PD. Panagiotis Papadimitratos
   Associate Professor, School of Electrical Engineering, KTH, Stockholm, Sweden

3. Dr. Spiridon Reveliotis
   Professor, School of Industrial & Systems Engineering, Georgia Institute of Technology, USA

4. Dr. Nikolaos Tsotsolas
   Director, AMBIENCE, Expert, Greece

5. Professor Antonios Tsourdos (Committee Coordinator)
   Chair in Control Engineering, School Of Engineering, Cranfield University, UK

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

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

Introduction

The External Evaluation Committee (EEC) visited the Electronics Engineering Department of (EED) of the Alexander Technological Educational Institute of Thessaloniki (ATEITH) during the period of December 16-18, 2013.

The first day of the visit (arrival time was just after noon) comprised:

(i)   Meeting the members of the Internal Evaluation Committee (IEC),

(ii)   Meeting the President of the Quality Assurance Unit (QAU) for ATEITH

The rest of the visit included visits to:

- Lecture rooms and laboratories
- Library facilities
- The Career & Liaison Office of the ATEITH
- The Research Contract Office of the ATEITH
- The ERASMUS Office of the ATEITH

It also included group and individual meetings with:

- Faculty
- Current students (including recent graduates)
- EED alumni

Most importantly, during the meetings, the staff, faculty, and the students and alumni present responded to a series of questions by the EEC. The provision of material relating to the evaluation was comprehensive, and any additional information requested by the EEC was provided by the IEC in a timely fashion and in full honesty. The EEC appreciated the hospitality of the EED faculty, as well as their willingness to facilitate access to premises, facilities and materials of importance to the external evaluation process. The EEC would also like to point out the high level of professionalism and collegial atmosphere during the visit, and express its gratitude and appreciation to the Department's Chair and the members of Faculty for all arrangements and a very well organized visit.

The EEC was provided with an Internal Evaluation Report (IER) by the EED. The IER comprised a plethora of sources and statistics, covering courses, research, students, academic staff and instructors. The EEC feels that the Department used all possible sources of information that could be identified and be made available to them. As a result, the report is deemed comprehensive and of high potential value as a strategic tool for the Department, the School, as well as the ATEITH.

Overall, the report provided valuable information regarding most major issues faced and addressed by other, similar in nature, academic departments of the ATEITH. In this context, some critical conclusions were drawn and analyzed to a satisfactory degree. In addition, the critical discussion that was provided in the report was deemed adequate, and it sought to respond to the general objectives of the evaluation process in the best possible way.

It is worth noting that the IEC felt that the evaluation process was a positive experience and expressed their willingness and desire to learn from the overall process and its conclusions. In addition, the Department expressed its desire to carefully consider the recommendations of the EEC and improve the overall approach and the operational procedures for all EED activities.

A. Curriculum

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

APPROACH

The current curriculum was revised in 2002 and it has been applied since 2003. It has been designed to facilitate the extension of the duration of undergraduate studies from 7 semesters to 8 semesters, and it was the outcome of deliberations that took place within the EED, some informal discussions with industrial representatives, and the requirement to remain compliant with the national legal framework. However, the EEC has not seen specific evidence of wider consultation with industry or student representatives.

The curriculum covers the discipline of electronics and their applications in industrial automation, telecommunications, informatics and services. By the end of the program of studies, graduates of the program are equipped with fundamental basic and advanced modern knowledge of electronics, so they are able to work independently or in collaboration with other professionals in analysis, design, development, supervision of construction, maintenance and control of electronic devices and systems, in applications such as telecommunications, optoelectronics, radio/television, safety, power electronics, computers and networks, medical devices, and industrial electronics and automation.

The program of studies involves modules of:

(i) general background (8 compulsory modules);

(ii) topic-specific background (14 compulsory modules);

(iii) specialization (8 compulsory and 6 selective from a pool of 18 modules);

(iv) management, finance, legal studies and humanities (4 compulsory modules);

(v) optional modules (4 selective from a pool of 16 modules).

In order to graduate, the student should successfully attend 44 modules out of a total of 68 modules on offer. Most modules have both a theoretical and a practical part that are delivered and assessed independently. In addition, students must complete a six-month internship and a final year thesis. In accordance with best practice in Europe, the Department also applies the European Credit Transfer and Accumulation System (ECTS), an EU-wide standard for comparing the study attainment and performance of students of higher education.

A postgraduate program on "Wireless Communications Systems" was in offer during the period spanning the academic years 2007-2008 and 2013-2014. The course was designed and validated by Brunel University, UK, and it was jointly delivered in the English language by academics of both institutions. The program of studies includes 8 compulsory modules on advanced topics and a dissertation. However, due to a decline of interest from perspective applicants, the course will not be offered for the academic year 2014-2015.

A new curriculum of undergraduate studies is currently being designed with the intention to be effective by the academic year 2014-2015. The aim of the new curriculum is to prepare employable engineers by providing a balanced program of studies covering both basic and advanced topics of electronics. Some specific objectives are the feasibility of the curriculum, modernization of the program of studies, academic quality, rationalization of the sequence of modules and employability of graduates.

A plan for the preparation of the new curriculum has been designed and followed by the Department. The roadmap until the final approval of the new curriculum includes regular weekly meetings of a relevant departmental committee, informal discussions with other members of the Department and industrial representatives, proposal of the new curriculum, moderation by the Department, approval by the ATEITH and final approval by H.Q.A.

IMPLEMENTATION

The topics and contents of the courses are comparable to those in the Electronics Engineering Bachelor of Engineering (EE BEng) in the UK academic system or similar programs elsewhere. The structure of the curriculum is rational and clearly articulated in the prospectus of studies. The content of the courses is appropriate for the aims of the curriculum as well as the lecture and examination time.

The contents and structure of the curriculum are well documented, both, in electronic format as well as in print. There is clear indication of the semester in which each module is offered and the official expectation with respect to student attendance. However, lab attendance is compulsory while attendance of lectures (theory) is not obligatory. Each module record contains satisfactory information such as the learning aims, the content, the bibliography, the mode of delivery (theory or lab), the ECTS credits and any prerequisites. The recommended textbooks and notes provided to the class for each module are generally appropriate.

The members of the academic faculty of the EED are generally well qualified to implement the curriculum, with industrial experience and/or PhD qualifications, and some have been trained on pedagogic disciplines and practices.

Also, in accordance with Law 1404/83, EED students go through a six-month internship that takes place before graduation and after the student has fulfilled a certain set of requirements with respect to his/her academic studies. EED students are successfully linked to regional and European companies and institutions for the purpose of performing these internships. A large pool of potential employers is kept by the department, and students are supported when they face difficulties, e.g. to identify a placement opportunity or when problems arise with the originally assigned employer. Furthermore, for a considerable number of students these internships have defined broader career opportunities and they have evolved to more permanent forms of employment.

On the other hand, the EED has identified specific issues of the current curriculum of the undergraduate studies that require addressing. The weak relationship between the theory and lab parts of most offered modules, in terms of registering, attending and assessing these parts, and the compulsory attendance of labs have led a very large number of students to focus on attending and being assessed on labs and to ignore the theoretical part. As a consequence, many students struggle to successfully complete the theoretical part of the modules in time and the link between theory and practice is broken. The currently provided freedom to register in almost any module at any semester, ignoring the recommended sequence of modules, has been abused by the students, and it has been common for students to register and attend advanced-topic modules of later semesters, although they lack fundamental knowledge provided by modules of early semesters. In addition, there is some overlap between the theory and the lab parts of the current modules that could be avoided by a tighter coupling of these two parts in a single offering. The new curriculum is designed with all the aforementioned issues in mind, and many of the proposed changes have been motivated by these concerns.

The quality assurance of the postgraduate program on Wireless Communications has been supervised by Brunel University. The majority of the modules (73%) was delivered by the academic faculty of Brunel University. Furthermore, the short duration, the rigid structure, as well as the costly nature and the selection process of this program have prevented the development of issues similar to those that occurred in the implementation of the undergraduate program of studies.

RESULTS

The Department provided statistics for graduates that registered in the undergraduate program of studies between the academic years 2002-2003 and 2007-2008. The bachelor degree average grade is approximately 6.5/10, with the majority of graduates (72%) having degree averages in the range of 6.0-6.9. More than 15% of graduates achieved average degrees higher than 7.0/10, including a percentage of 1.5% with excellent (above 8.5/10) degrees. Overall, these statistics are deemed satisfactory.

However, the main challenge faced by the faculty is the high graduation time and the low completion rate. Specifically, from the provided statistics, approximately 50% of the registered students fail to

graduate within 10 years. Successful students require 8.3 years on average to graduate, very few manage to graduate within 5 years (~2.8%) and a large majority (70%) requires more than 6 years. If the trend of statistics is extrapolated to future years, only 10% of the registered students will be able to graduate within the new upper limit of 6 years of studies that was introduced by recent regulation. The EEC agrees with the EED that the roots of the problem are (i) the program entry standards that are specified externally, and (ii) the weaknesses of the current curriculum, i.e. the misuse of free module registration by students and the loose connection between theory and practice in modules, as discussed in the previous section. As already mentioned, the EED anticipates addressing at least the latter with the introduction of the new curriculum in the next academic year (2014-2015).

The completion rate of the postgraduate program on Wireless Communications is very high (~93%). According to the EED faculty, this is the result of the high entry standards and the rigid course structure that were adopted for this program.

From informal discussion with members of the academic staff and some graduates, the absorption of the latter in the regional and European labor market is generally satisfactory. The connection of students and graduates to the European labor market through ERASMUS and the Career Office is considered important for the job prospects of the graduates at the current economic climate in Greece. Graduates confirmed that the knowledge and skills they obtained during their studies enable them to have successful relevant careers. However, they also felt that the coverage of non-technical topics such as management and entrepreneurship is not adequate and there is space for further improvement.

IMPROVEMENT

The Department has identified the weaknesses of the current curriculum and intends to address them with the introduction of the new curriculum. Specifically, a draft of the new curriculum proposes unifying the theory and the lab parts of each module to prevent students ignoring the theory part. In addition, this draft suggests the introduction of a new type of teaching sessions, named "Exercises/Activities", that will require students' active participation.

In an effort to rationalize the sequence of modules that students register, attend and are assessed in, students' freedom to register for modules of later semesters will be restricted twofold. Firstly, students will be enforced to prioritize their module selections according to the temporal order of modules in the curriculum. Secondly, the order of modules that are relevant to each other will be improved.

Modules and their contents will be modernized, according to recent advances in technology, as well as the current market and societal trends and needs. Specifically, new modules such as "Renewable Energy", "Electrical Machines", "Robotics" and "Technical Writing/Presentation" will be introduced, and the content of a range of existing modules will be updated. At the same time, overlapping between modules will be addressed to provide space for the new content.

On the more operational side, the role of Student Advisor will be introduced to guide and support the students during their studies, although the details of the implementation may need further clarification.

The EEC applauds the draft proposal for the new curriculum. In addition, it suggests that the following structures and mechanisms would be beneficial as they will support a continuous evaluation and evolution of the curriculum:

- Yearly module folders that will contain all relevant information for each module, such as module descriptions, action plan, assessment statistics, record of student feedback, exam papers/coursework assignments/practical exercises.

- Internal and external assessment moderation and evaluation.

- Faculty-student consultation meetings that would enable a systematic monitoring of the student advancement through the program and would help keeping the students closer to their program of studies in a more proactive manner.

- The development of an alumni society, supported by social networking services, which would

further improve the connection between students and the labor market.

- An industrial advisory board that will provide feedback to the Department about immediate and future needs of the labor market from prospective graduates and will advise about the suitability of the curriculum.

- Regular (e.g. yearly) Exam Boards that will include External Examiners, will check the results of modules across the program, and will drive the evaluation and the evolution of the curriculum.

- The development of a new MSc program with a stronger ownership by EED.

B. Teaching

APPROACH

The employed teaching methods are based on the Department's goal to educate its students by providing them with good theoretical as well as practical knowledge and experience. This is considered necessary for a career in the field of electronics engineering. Following the common setup of most TEI departments with an applied technological character, EED has adopted the traditional method of lectures and laboratory work. Attendance at lectures is not compulsory, whereas for laboratory work student attendance is obligatory.

An important part of the undergraduate program is the six-month internship (practical training), which gives the opportunity to the students to obtain valuable work experience. The EED has a dedicated faculty member as internship advisor with positive feedback from both industry and students.

The faculty-student ratio is not a constant ratio. In early semesters, the ratio is higher, while in the later semesters it is lower, with an average ratio 1:60 (faculty : students). Students participate in lab sessions in small classes (averaging 25 students per session), which allow strong interaction with the teaching staff. Theory lectures are usually given to audiences ranging from a few to several tens of students.

While the Department recognizes the importance of effective teacher-student collaboration, there is no formal student advisory role in place. However students are encouraged to seek faculty advice and the faculty seems to make every effort to be available for providing advice. In the future, there are plans for formally establishing a role such as student advisor.

The laboratory facilities, departmental administrative offices, and the faculty and staff offices are located in the same building. Both, laboratories and lecture rooms are modern and provide appropriate accommodation to students and staff. There is Wi-Fi available in all areas of the EED building. The EEC had the opportunity to visit selected laboratories. The Department should carry out a systematic evaluation of each research and teaching laboratory, taking into account the skills its students need to acquire and the needs of the market. This would help the Department to identify and prioritize areas of improvement, in line with the Departmental medium/long planning. The laboratory regulations concerning health, safety and rules of conduct were available to all students, for every laboratory, in accordance to international standards of laboratory-based teaching.

In the immediate future, the experienced reduction in the number of the employed temporary staff (adjunct faculty), and the reduced budget for consumables (necessary for the regular operation of teaching laboratories) and equipment upgrades (also significant for research laboratories), due to the financial crisis affecting the country, may have a significant impact on the teaching and research activity taking place in these laboratories, and thus, the quality of education and research results of the Department.

IMPLEMENTATION

It is clear that the EED faculty members have a great deal of interest in their students and the quality of knowledge they gain through their courses. As a result, it is obvious they are doing their best to provide the best education they can. Course material was deemed of good quality. Students conveyed that most modules (both theoretical and experimental) met their expectations. Additionally, industries with large number of interns from EED appear to be satisfactory by the level of education of the interns.

The student evaluation of teaching is done through questionnaires. These questionnaires could also be the means for evaluating the intended learning outcome (ILO) of each module. The nature of the questions and ability to include comments should also be planned for the questionnaires. Also, given the more qualitative nature of the sought information, the communication of the obtained in terms of "statistical averages" is rather impertinent; the provision of the relevant distributions would be more appropriate.

It is very encouraging that some faculty members are engaging in research. Most of the active researchers are incorporating their findings in their teaching, and expose students to the latest scientific trends in their respective fields, to the best of their abilities and knowledge.

The Department presented to the EEC a number of international collaborations with a number of foreign institutions. The EEC would like to note that this activity is highly commendable. The EEC also noted that EED students are encouraged to take advantage of student exchange programs (e.g., ERASMUS) and work on their graduation thesis projects at a variety of collaborating institutions in EU. Moreover, a number of courses are offered in English not only for ERASMUS students but also for EED students. The EEC would like to encourage the further development of mobility programs and the increased participation to these programs by a larger number of both students and faculty.

Finally, while there is a good use of industrial links for assisting students with the six-month compulsory internship, there is space for improvement by better utilization of the EED alumni.

RESULTS

The efficacy of teaching is generally good. However, there is a low attendance rate and long-lag for graduation. While it is understood this is common practice in the higher education sector, the current average duration of 8.3 years for completion of studies poses a threat. EED is concerned and steps to address this problem are considered and would be implemented from next academic year.

The main challenge in the course teaching is a large number of entrants and the wide range of their backgrounds. The large number of entrants poses a significant stress in modules of early semesters. In the last few years, the entry requirements for applicants were decreased significantly. As a result, both students and faculty identified the challenge of the discrepancy between the aspired level of the program and the students' background.

The Department does not formally consider discrepancies in success and failure rates between modules. Quality of examination questions, grading schemes, examination of scripts, grade transcription and final module assessments are all left entirely up to the individuals (EED faculty and staff) teaching a specific module. Any corrective actions can only be taken by the individual concerned, if they choose to do so. The EEC would encourage EED to become more proactive and establish systems and/or procedures for assessing the quality of examination results, such as the adoption of an Exam Board and External Examiners.

IMPROVEMENT

The Department presented to the EEC a number of potential opportunities for improving its teaching activities. The primary one was the revised curriculum of the undergraduate studies. EED should also be encouraged to put forward postgraduate studies (an MSc program). Also, if EED was provided with a better control on the number of accepted students, this could result to better planning of resources.

The EEC noted the absence of any quality assurance procedures related to the examination process and encourages the Department to address this. The quality of every aspect of examination should not be left simply to the good will of each faculty member. It is important that a unified process is established that ensures transparency, correctness, fairness and compatibility across all modules.

The current good cooperation with industry can be further formalized through the development of an Industrial Advisory Board. Furthermore, better links with industry, with introduction of seminars by well-targeted industrial partners of the EED, should also be planned.

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

APPROACH

The EED faculty members are in principle aware of the need to undertake research projects, notably collaborative ones. They have demonstrated this through a number of projects. Moreover, they have produced a number of peer reviewed journal and conference/workshop papers, as a result of their activities overall, either independently or in relation to the obtained funded projects. The EED faculty members leverage their own interests, their laboratories (to the extent they can support research activities), and their collaborations with industrial and other academic partners to engage in research activities that produce journal and conference publications, and, in some cases, result in significant outreach. They reported to the EEC that there are no specific criteria and schemes that would allow them to obtain additional funding (internally) and pace their promotions based on their research output.

IMPLEMENTATION

The EED faculty wishes to continue seeing research results and they are eager to obtain research funding. Over the period from 2006 till nowadays, and including awarded projects that extend to 2015, EED faculty members have obtained funding from the following sources:

- The ATEI of Thessaloniki (ATEITH) Research Commission (www.ee.teithe.gr/index.php): a total of nine (9) projects were granted for a total of fifty seven thousand and eight hundred (57 800) Euros. These are small-budget projects awarded internally, within the ATEITH, and they can serve as seed activities or produce specific technical outcomes that subsequently can be further used for research purposes or lead to interesting applications and technical studies. The EEC does not have statistics on the overall success rate of the relevant submission process.

- The Archimedes program, notably phase III (www.edulll.gr/?p=914), which is available for the support and strengthening of research teams in TEI programs in Greece. A total of two (2) projects were awarded with a total budget of two hundred thousand (200 000) euros; each project was funded at the level of 100 000 euros.

- The Ministry of Education research program (www.epeaek.gr/epeaek/el/index.html), but no further data have been provided for this program.

- The Prefecture of Thessaloniki (www.pkm.gov.gr/default.aspx?lang=el-GR&page=89), with two (2) funded projects and a total budget of 10 800 euros.

- The Central Macedonia Innovation hub (www.innopole.gr/index_en.php), in collaboration with two companies: One project has been funded for a total of 30000 euros. Moreover, a private contractor has provided an additional project of 6 800 euros.

- The National Strategic Research Framework (www.espa.gr/el/Pages/Default.aspx), with two projects under the "Collaboration" initiative, for a total of 248 150 euros, and one subcontracting project with a 100 000 euros budget for EED.

The total amount of external funding for projects active within the past five years rises to approximately five hundred and forty three thousand (543 000) euros. Out of these, 330 000 euros pertain to projects with an EED faculty member as the scientist in charge (principal investigator (PI)). For the remaining funding, the EED faculty members are either co-PIs or members of the scientific team. The EEC has the feeling that the funding was obtained through competitive calls, given the possibly large number of submitted proposals; nevertheless, the EEC does not have precise information in that regard.

The EED faculty members in some cases collaborate with each other within the same project, or with faculty from two (2) other ATEI departments, two (2) departments of the neighboring Aristotle University and five (5) foreign academic institutes. Individual opportunities and the network of each

faculty member drive engagement in projects, e.g., the research groups where each faculty member obtained his/her PhD or collaborating industry. In some cases, the EEC observed through presentations and discussions a well-defined synergy with the collaborating partners.

An additional project, ORCA, was also presented during a lab visit (orca.feit.ukim.edu.mk/). The effort seemed to be driven primarily by an adjunct researcher that is not an EED faculty member.

EED's research primarily leverages the established teaching lab resources. Most of this equipment is dedicated to teaching, but there is also equipment acquired through projects. The Research Committee (http://elke.teipir.gr/syndesmoi/epitrope-ereunon-atei-thessalonikes) of ATEITH acts as the authorized representative and provides administrative and financial support during the project proposal submission and execution phases.

Scientific publications are pursued and, for the 2008-2013 period, the numbers reported to the committee are: 57 journal and 78 conference publications. The number of citations over the same period (pertaining to all publications prior to the aforementioned years) is 384. An interesting observation is that while the number of publications decreases mildly over the last two years, the citation count increases. Certainly this observed increase in the citation count is very welcome. On the other hand, the reduction in the publications number itself could be attributed to a reduced number of external collaborators and the increased teaching and administrative workload.

The EEC does not have data to compare the scientific output and impact to those of other similar Departments in ATEITH. In terms of the publication volume, 27 papers per year correspond to roughly 3 papers per faculty member per year (excluding the lab-supporting staff) or slightly less than 2 papers per faculty per year overall. Given the overall conditions and history of the Department, and its ongoing transition over the past years, this is a very positive outcome.

Looking at the targeted journals and venues, one can find a significant number of high-quality publications, including for example:

- IEEE journals, such as the Transactions on Instrumentation and Measurement, Power Electronics, Electronics Devices, Energy Conversion and the Journal of Display Technology;

- Elsevier journals, such as the Solid State Ionics, Material Science Engineering, Alloys and Compounds, and Microelectronics;

- Springer journals such as the Material Science and Applied Mathematical Science; and

- Wiley journals such as the Physica Status Solidi.

The conference publications include a number of papers in IEEE conferences, symposia and workshops. There is overall good productivity by many of the faculty members.

RESULTS

Certainly, the aforementioned efforts have produced some pretty tangible results, and the EED faculty members are cognizant of the importance to produce research results and attract funding. The scientific publications, and especially the journal publications, are good in numbers and appear in good journals. Two papers per faculty per year is a good starting point and a good objective to achieve consistently across the EED faculty.

The research projects were executed successfully based on evidence presented to the EEC. The EEC did not develop a detailed catalog of the published material, patents, or products generated by every project. On the other hand, the Committee was positively impressed by the fact that some of these projects had received publicity in the local media and press (e.g., the high definition TV emission, and some health-related RF measurements in schools).

The dissemination of the obtained project results did not follow any specific norms overall, e.g., EU norms for project-related websites. Similarly, some longer-term benefits of these projects for EED were not very clear (e.g., which hardware or software was obtained through the corresponding activity); but the EEC did see lab know-how and equipment enhanced due to project undertaking and participation.

Finally, the EEC observed that it was personal contacts and prior research experience of the EED faculty members, frequently established through the preparation of their PhD dissertations, that drove collaborations and the undertaken research projects, rather than a more organized, cross-lab or broader School / Institute strategy-driven approach.

IMPROVEMENT

The Internal Evaluation Report (IER) that was provided to the EEC contains a number of critical points that suggest the following improvement opportunities:

– The need for a research strategy for EED, given the relatively small number of faculty members with very diverse areas of interest.

– The need to increase the departmental research funding.

– The lack of research labs and doctoral students.

The EEC agrees that EED should create a clear set of research objectives for the Department and a roadmap to achieve those objectives. A structured discussion within EED and its various labs, as well as the extension of this discussion within the School and the ATEITH administration, is strongly recommended. This discussion should also engage the EED alumni and the local labor market and industry. The focus and alignment to real market needs is important due to the applied nature of most of the supported research and the EED profile.

Active participation in research projects is also strongly encouraged, to help EED expand and increase its available resources. This participation can help EED enter new areas, evolve and modernize equipment and lab infrastructure, or even establish new labs. Furthermore, this activity can solve practical, pressing problems such as covering of consumables and equipment expenses (vital for laboratories) and stuffing.

It is understandable that there is no strong and well-defined research culture across EED, given the overall history of ATEITH and the broader TEI framework, their initial mandate, and the fairly recent redefinition of these academic environments as more research-oriented institutes. Yet, as discussed in the earlier parts of this section, many substantial steps have been taken in that direction, while there is also considerable space for improvement. The EEC recommends a strategy for the development of a more structured and more expansive research program that will be based on the following points:

1. The promotion and establishment of an environment where all EED faculty members are proactively encouraged to personally engage in sponsored research.

2. The establishment of monitoring mechanisms that will measure not only the research productivity of each faculty member, but also the quality of the generated research. A tangible way to assess this quality is the quality of the venues (journals, conferences, and other fora) that are used for the dissemination of the results.

3. The expansion and systematization of the ongoing efforts to attract external projects, and the coupling of those efforts with scholarly publications, demonstrable results, maturation of technologies, and further notions of innovation. In particular, the pertinent coordination of these endeavors across the EED labs and the labs of other Departments of ATEITH can strengthen the quality and the prospects of the generated proposals and enhance the benefits.

4. The formulation of specific objectives towards technology transfer and innovation. These objectives can define a strong comparative advantage for EED, given the applied nature of the supported research and its connections to the local and the regional industry and institutes.

5. The stronger integration of research and teaching, through the specification of the theses that are conducted in the EED program(s), other course projects, and the continuous updating of the course material.

6. The buildup of a set of "success stories" (e.g., particular project results and activities, tech

transfer, startups, other major initiatives) that will introduce and promote the EED activities to the community.

D. All Other Services

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

APPROACH

EED provides a set of services to students and faculty (permanent and temporary), either independently or in collaboration with the central administration of the Institute. These are regular services provided by any TEI in Greece and they are designed to comply with the needs of faculty and students. The information in relation to support services that was provided to the EEC in advance of its visit is primarily summarized in the Internal Evaluation Report of the Department. During the visit, the EEC had the opportunity to meet the 2 members of staff that provide administrative support to the Department. Visits were also made to various institutional support services that operate at the broader ATEITH level and are available to student and faculty of the Department; these include the library, the Career Office, the Research Committee and the Erasmus Office. The EEC also examined the Departmental web page as well as the two electronic platforms (i.e., e-mathisi, PYTHIA), in support of the educational process.

Particular focus is given to the simplification of the procedures, the speeding-up of service delivery and the satisfaction associated with service provision. To this end, the Department has made a substantial effort to develop the infrastructure for the provision of electronic services across the entire range of its operation. Special attention is given to the way the administrative staff members collaborate with the Departmental community on a personal level so as to maintain a very good level of interpersonal relations that helps them to carry out the procedures effectively. Equally important is the commitment of the administrative staff to provide effective access to information using the web for all the activities of the Department. The students of the Department are provided with a complete set of services related not only to educational issues but also to thesis preparation, practical training, student mobility, student welfare, and broader access to information (email, ftp, personal web page, internet access, library).

There is a need of extending the electronic services in order to support more administrative procedures, e.g. the application and issuing of certificates for the students. Furthermore, some focus is needed on cultural activities.

The Department is taking care of issues related to disabled accessibility to Departmental and Institutional facilities.

In the following subsections, the EEC evaluates the implementation and impact of the following service categories: administrative support to students, faculty and staff, access to information, library, access to PCs and to the Internet, internships, mobility, catering, recreational activities and accessibility.

IMPLEMENTATION

Administrative support to students: The Departmental administration is well organized and equipped. It is staffed by two administrators and hosted in a small but well-equipped environment. The secretariat office is open to the public / students between 11:00am to 13:00pm all weekdays. Several among the services provided to students that are related to the educational process are supported by two electronic platforms and one server application. The first, "PYTHIA", concerns the registration to individual modules, course grading and grades reporting. The second is the platform "e-mathisi", a web-based asynchronous e-learning platform through which the faculty members provide detailed information about each course, additional training materials, coursework, bibliography, links, corrections concerning the provided books and other educational materials, etc. Another server application allows the students to register to the laboratories and supports the allocation of time slots. Furthermore, students are supported concerning the acquisition of books by the electronic system "Evdoxos", which supports all higher education institutions in Greece.

Provision of information: The departmental website is updated on a continuous basis, and it contains

adequate information, both, in terms of informing its students for all academic issues as well as promoting the educational and R&D activity of the Department. Its layout is very professional and it provides a user-friendly navigation. A large part of the posted information is provided in English as well.

As far as the student advisement is concerned, the EEC has been informed that the role of Students Advisor has not yet been activated. Nevertheless, given the very good relationship between faculty and students, several students contact the educational staff for any issue that has to do with their studies or on any other matter during their study.

Library: There is one central library for all the departments of ATEI. It is not very spacious, but it is very well organized and it has 12 members of staff who provide the necessary support and assistance. It has almost 35.000 titles; it is linked to other University libraries throughout Greece and it can offer interlibrary services. The electronic services provided by the library through the library portal are considered to be adequate for the needs of students and faculty. It operates an Online Public Access Catalogue (OPAC), an electronic Greek Periodicals Literature, and an electronic Institutional Repository in which student theses, faculty publications, administrative records and archival material are kept. It also provides access to information concerning 12,000 Scientific Journals and 120,000 Conference Proceedings through Web of Knowledge. The library also provides access to hundreds of on-line scientific journals through HEAL-Link (Hellenic Academic Libraries Link), and support concerning citations through an Online Bibliographic Management Tool which is used for citing resources according to the styles: APA, Harvard, MLA and Turabian. There is a very small study space in the library and at the time of the visit a big number of students were present. The library maintains hardcopies of all students' theses.

Access to PCs and Internet: The Department is connected to the web through high-speed Gigabit optical fibers. Internet access is available free of charge and the students may use the Wi-Fi infrastructure using their own laptop computers, as well as 35 terminals placed in the Internet services lab (NAUTILUS). Furthermore, the students of the Department may be connected to the Internet through a Local Area Network (LAN). The network supports 400 terminals (20 -25 terminals at each laboratory). The terminals are connected to the server of the Department named Titanas. The server is connected to the main frame of the ATEITH, which is located at the Department of Informatics, through optical fibers. The maximum communication data rate is 200Mbps. Every student may request a personal account to access the network. The account is given to the student at the ATEITH Network Operations Center (NOC). Moreover, the account provides access to the internet through a dial-up connection for students living outside the campus. The users are also provided with services of e-mail, webpage and ftp.

Internship: The Departmental administration also assists students with their six-month internships that are undertaken during the last year of their study. It monitors the whole process and keeps detailed records of all placements. This service is not supported by any of the aforementioned electronic platforms. Unfortunately, even though the Department keeps an updated list of all companies which provide internship positions, there is no formal procedure for keeping records concerning the employment and destination of graduates, which if better organized and used may help the departmental objectives.

Mobility: Students' mobility is supported by the Erasmus office, a central facility at ATEITH that appears to be well organized and very active with the Erasmus program. EED maintains Erasmus agreements with several good Universities across Europe. The EEC was informed that, on average, about 10 students are exchanged annually at a departmental level.

Research Support: The Research Committee office provides administrative support to the faculty of the Department for the implementation of their funded research projects. It also provides information through its web site concerning the status of the research projects as well as the various calls for proposals at National and EU level.

Catering services: Inside the campus there is a restaurant, open at lunchtime and in the evenings, providing good quality meals to students and staff. The students of ATEITH may also have free meals at a restaurant located at the center of the city of Thessaloniki.

Recreational activities: ATEITH provides centrally some sports facilities to the students on its campus.

Accessibility: The Department and the Institute have a clear accessibility policy, especially for disabled access, and they provide the necessary support.

RESULTS

Administrative support to students: During its visit, the EEC asked several students to evaluate the quality of the services provided by the Department's administration, and the level of satisfaction was particularly high. Clerical and administrative staff gave the impression of being friendly and helpful, committed to the well-functioning of the Department. The certificates and other documents are not issued electronically.

Administrative support to educational staff: Members of the academic faculty also expressed a high level of satisfaction from the services provided by the Departmental administration.

Provision of information: Students are being informed for departmental activities through the web site, which has all the necessary information / documents and the electronic platforms. On the other hand, the PYTHIA course-management system is used only for course registration and grading, and no other information concerning the courses is entered in this system. All necessary information concerning each course is found in the "e-mathisis" e-learning platform.

Library: The library provides very good quality services but a much larger study space is needed. Each year freshman seminars on books, periodicals and access tools are organized. Other seminars are also organized, dealing with issues such as writing essays and dissertations, referencing, copying and plagiarism.

Access to PCs and the Internet: There is no problem in relation to internet access. The IT infrastructure (Wi-Fi, computer room) is broadly considered sufficient.

Internship: Students are not facing difficulties in finding industrial placements, and the Departmental coordinator supports effectively the whole process. On the other hand, the absence of an information system keeping track and reporting the internship opportunities is considered as a weakness, in addition to the absence of a formal tracking process of the employment status of the Department's graduates.

Mobility: The support provided to students who are exchanged, both, to the EU and from the EU under the ERASMUS framework, is very good.

Research Support: The support provided by the Research Committee is not considered sufficient, both, in the preparation phase of a project (proposal writing and submission) and in the implementation phase (progress and financial reporting).

Catering services: Catering services provided on campus and at the restaurant located at the center of the city of Thessaloniki are considered adequate.

In addition, the offered variety of sports facilities is adequate and contributes to the student wellbeing.

Recreational activities: ATEITH lacks recreational activities, apart from some sports activities, which could contribute to the wellbeing and recreation of students.

Accessibility: The infrastructure is considered adequate in relation to accessibility issues concerning the Departmental buildings as well as the Central buildings.

IMPROVEMENTS

During the EEC's meetings with staff, several propositions for improving the departmental operations were identified and further discussed.

A more paperless implementation of certain processes should be supported, and re-organized through electronic tools; in particular, the issuing of certificates of study, the following-up of internships, the maintenance of a full educational folder for each student, etc., could be supported by an Information System.

The electronic platform that supports the educational student needs should be upgraded in order to serve better the educational process. Towards this direction, the Department is planning to start

using the Moodle platform.

It would be particularly beneficial for the Department to improve its database of businesses and of company profiles for an even more effective management of internship placement, taking advantage of a documented tracking of graduate and company performance. This extension of the information management could increase the liaison between the department and the job market. It will also allow better organization of educational visits to companies found in the database. The cost of such minor upgrades could be low given the fact that the Institute could develop such applications internally. It is the EEC's view that there is space for improvement of web site exposure and material for further promotion of the departmental research activities, projects and achievements.

As far as student advisement is concerned, a studies advisor scheme is proposed whereby each student is assigned to an advisor who provides some much-needed help, especially to first-year students.

Finally, as far as the project acquisition and implementation is concerned, three things could increase EED's efficiency in this field. A first major step could be the permission to the EED laboratories to provide research and development services, as well as product development services, directly to the market, without the current lengthy and bureaucratic procedures. On the other hand, the EED faculty should increase their efforts in collaborating with research networks, formal and informal, in order to be able at any time to build strong consortia for submitting proposals for funded projects at national and international levels. A third step is the improvement of the supporting services that are provided by the Research Committee during the preparation and implementation of the targeted projects.

Collaboration with social, cultural and production organizations

Even though the Department is collaborating with some local authorities' organizations in the area, actually it is not very active in building and maintaining stable and sustainable partnerships with social and industrial organizations, or in participating actively in the development of local / regional development plans.

On the other hand, the Department is in close cooperation with major companies, especially in the broader region of Northern Greece, regarding knowledge transfer to these companies of in-house R&D expertise. This cooperation could be further strengthened through two main axes:

(i) the development of a comprehensive policy of openness (a Standing Committee liaison with market, which involves company executives - graduates disseminating research results through local and national media, communication and visits to schools, promoting the department, the subject and the aims of the course);

(ii) the institutionalization of the laboratories of the Department in order to be able to directly provide research services to businesses.

Finally, it was communicated to the EEC that the Department had organized some years ago an event with the participation of its past graduates, aiming at discussing the current trends in the labor market and seeking the help of these graduates for revising and promoting the aims of the Department. Such events should be organized on a more permanent basis, and further structured through the institutionalization of an Industrial Advisory Board.

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.

The Internal Evaluation Report that was provided to the EEC by EED contains a section on strategic planning and development, and also a section articulating particular improvement steps that were proposed by EED's Internal Evaluation Committee. Furthermore, this material was pertinently summarized in a set of slides presented by the Department Chair to the EEC during the latter's local visit to the Department. The subsequent discussion is based on the aforementioned input and on the EEC's own findings and deliberations during that visit. Furthermore, the major findings that are reported below were briefly discussed during a closing meeting among the EEC, the EED Chair, and the President of the Quality Assurance Unit (QAU) of ATEITH, and they convey rather common positions and perspectives of all these parties.

From an organizational standpoint, the subsequent discussion is organized in two major parts: The first part communicates the aforementioned material in the form of a SWOT (Strengths-Weaknesses-Opportunities-Threats) Analysis, and it is further supported by the material that is provided in the earlier parts of this report. The second part articulates a series of recommendations that derive naturally from the SWOT analysis.

A) The SWOT Analysis

We begin the presentation of the SWOT Analysis by overviewing EED's mission statement. This statement provides further focus and context for all the subsequent discussion. Hence, according to the provided IER and the accompanying presentation, EED recognizes as its primary mission the development and graduation of electronics engineers for the regional labor market who are highly marketable and ready for employment in the local industry and the public sector. This objective is (to be) attained through a balanced coverage of the various areas of electronics engineering and its (cutting-edge) applications by the program curriculum, and the maintenance of a balanced exposure of the students to the implementation aspects of these applications and their theoretical underpinnings.

Indeed, according to the provided IER and the EEC's own findings during the site visit, EED's graduates enjoy high levels of recognition and acceptance in the regional labor market. This positive image is due to the excellent training of the EED's graduates and the alignment of their skills to the local market needs, and also, to the strong and long-lasting ties that exist between EED and some of the local production and service industries. These established relationships and the overall reputation of the Department also enable it to maintain a strong internship / practical training program that complements and enhances substantially the educational experiences of its graduates and, at the same time, facilitates their placement at the local job market. All the aforementioned developments have further culminated in a group of enthusiastic alumni who seek to retain their connection to the Department and who are eager to support the Department in its ongoing endeavors and in any new undertakings.

At the same time, EED has sought to enrich and expand the student horizons and opportunities through a very active participation in the ERASMUS student exchange program. Along these lines, it is especially notable that a number of the recent student placements through the aforementioned program are in corporate openings in Germany and some other industrially advanced Western European countries. In certain cases, this interaction has given the involved students the opportunity to pursue further careers in the host companies and/or countries, but, even more importantly, it has enabled EED to "showcase" and prove its strengths and qualities in the highly competitive context of those environments.

On the more operational side, EED enjoys the advantage of a spacious and well-equipped facility. More generally, and in spite of the fact that the recent economic crisis that is experienced by the Greek state has reduced substantially the financial, human and other resources that are provided to EED in support of its ongoing operations, the EEC feels that the Department has managed to support its key functions in a way that does not compromise substantially the aforestated mission and the sought qualities and objectives. Furthermore, the EEC considers that the Department's leadership

and faculty enjoy the support and have a constructive collaboration with the Senior Administration of the unit, an element that is especially critical for a smooth and successful operation in the context of the current economic hardship. Finally, the EEC wants also to comment the faculty's alertness to the challenges that are defined by the current financial crisis in Greece, and their self-motivation to surpass these challenges through a personal offering and a thoughtful and constructive attitude towards the experienced hardships.

Some particular operational difficulties (inhibiting factors) that are currently faced by EED's leadership and faculty, and have surfaced during the EEC's deliberations with them, can be epitomized as follows:

- The lack of sufficient structure that will assist the faculty in its teaching, research and administrative tasks. This issue manifests itself in many different manners: From the lack of a structured student advisement program, to the lack of structured career services and communication with the departmental graduates and alumni, to the lack of structured teaching evaluation procedures and feedback mechanisms, and finally, the lack of a formal and rationalized framework for synergistic collaboration and partnerships across the School departmental units.

- The aforementioned problems are further exacerbated by an academically weak and often non-motivated student base, and an obscure and inflexible institutional framework that encumber the Department and they do not allow it to proactively strengthen its niches and promote its competitive advantages.

- Related to the above two points is the fact that the current curriculum is partly outdated and, more importantly, it has failed to establish sufficient structure that would result in a rational and timely coverage of the targeted material. However, this issue is currently proactively addressed through the development of an updated and streamlined curriculum that will be initiated during the next academic year (Fall 2014).

- With respect to curriculum development, the EED leadership and faculty also feel that there is a substantial need to develop postgraduate programs, in the form of some Master's level programs, that will target the local market and even the broader region that is defined by the neighboring countries and their industries. On the other hand, while acknowledging the scholarly merits and the potential advantages of such an endeavor, the EEC also maintains some reservations about its pertinence and viability, given (i) the prior experience with the MSc. offering between EED and the School of Engineering and Design of Brunel University, UK, and (ii) the dire conditions of the local and regional economy.

- The EEC itself perceives as a more pressing need the further strengthening of the Department's R&D capabilities and activity, through the development of a more structured (strategic) research partnership and collaboration between EED and the Electrical and Computer Systems Engineering Department of the local Aristotle University, as well as with similar academic units in other universities and technological institutions that are located in the same geographical region, or that are already related to EED through past and ongoing collaborations.

- In the same spirit, EED can further structure and tighten its ongoing collaborations and more general affiliations with some of its industrial base and its committed alumni, in a way that capitalizes upon and strengthens its existing R&D capabilities, and highlights the value that these capabilities define for the corresponding industries.

- Finally, the EEC's interaction with some alumni and current students also revealed a need to revamp the EED curriculum pertaining to management / business administration, economics, law and humanities, through the offering of courses in these four areas that address more explicitly the modern principles and practices in these fields, especially as experienced by practicing engineers and new entrepreneurs.

The EEC believes that, if properly addressed, the aforecited points define a series of opportunities for EED. Critical for a strategic positioning and realization of these opportunities is the strong technological base of the EED graduates and the pursued balance of their practical technical skills with a good understanding of the "background" theory, that have rendered these graduates an

attractive pool for the local as well as the broader industries (c.f. the earlier discussion on the departmental strengths and the employability of the EED graduates). In fact, the EEC strongly believes that, if properly used, many of these graduates can be a significant national asset in any endeavor to restart and revitalize the failing national industry and economy.

At the same time, EED must clearly understand the competitive advantage and the "core value" that is defined for it by its current mission, and establish appropriate objectives and developmental strategies that will capitalize upon and further promote and strengthen this niche. On the academic side, the ongoing research collaborations, and the faculty and the student mobility that takes place in the context of the ERASMUS and other exchange programs, provide valuable experience and a strong "springboard" for the further shaping and the promotion of the Department's identity and role in the current academic landscape. The department must also promote and strengthen the recognition and the acceptance that it enjoys in the local industry, as well as in the broader industrial base, that has been cultivated through the years by the personal contacts of its faculty and its successful student placement; the recent interest in EED and its graduates expressed by companies like Continental, is a very telling example. Finally, the industrial base of the neighboring countries, if properly explored and cultivated, could define new opportunities for student placement, but also new demand for educational (including postgraduate) services.

On the internal side, the ongoing restructuring and the further rationalization of the curriculum can strengthen the qualities of the departmental graduates, enhance their academic experience, and streamline the instructional process itself. Further efficiencies can be attained through the identification and the exploitation of any potential synergies that exist between EED and other units of the ATEITH. This issue becomes even more imperative in the face of the resource scarcity that has been brought about by the current economic crisis.

Finally, the recent institutionalization by the ATEITH of quality assessment procedures regarding the teaching function, in combination with the external evaluation practices that are supported and promoted by HQA, offer important frameworks and tools that can help EED to better monitor its progress with respect to the defined objectives, and to develop the corrective and intervening capability that will lead to these objectives in a smooth and methodical manner.

On the other hand, both, the EED Internal Evaluation Report and the EEC acknowledge a number of potential threats to the EED stated mission and its current and future success. The most prominent of these concerns relate to the ongoing financial crisis of the Greek state and economy, and can be summarized as follows:

- The current tightness of the state-provided budget that is experienced by every academic unit in Greece.

- The loss of a very large number of adjunct faculty members that supported a substantial part of EED's teaching function in the previous years. This loss has raised the student/faculty ratio to 60:1, and there is an apprehension among the EED faculty that in the upcoming years this ratio will become even worse due to impending retirements among the faculty and the currently imposed hiring freeze.

- The market volatility that has resulted from the current economic crisis is also recognized as a major challenge to any ongoing endeavor for further rationalization and planning of the future departmental activity. This volatility has been especially disruptive in the recent past, leading, in particular, to the abrupt termination of EED's MSc. degree program, but, more importantly, it renders especially difficult the determination of the market trends and needs for the near future.

- Things can be further aggravated by an unstable and non-transparent state policy regarding the institutional framework that regulates the operation of the national technological institutions in terms of student admission policies, funding and the governance of their academic units.

- Finally, the resource tightness, and the market instability and uncertainty that are described in the previous paragraphs can only have a further demoralizing effect on an already challenged and lingering student base, and they can lead to a severe disruption of the value

buildup that has been pursued by EED over the long interval of its academic existence.

Closing this SWOT analysis, an additional issue that the EEC wants to bring to the attention of the EED faculty and its leadership is the role and the impact of the modern information technology in higher education. This technology has the potential to complement and enhance substantially the student experience in terms of the organization, dissemination and presentation of the course content and the administration of other supporting functions, like the (virtual) lab execution, the student advisement and tutoring, and the exam administration and grading. EED has already recognized and exploited this potential in its current operations through "e-mathisi", an internally deployed web-based platform for the organization and dissemination of supportive material for the departmental labs and course offerings. Yet, and even more importantly, when it comes to higher technological education, the aforementioned information technologies define and support new business trends and practices with respect to the organization and the remote delivery of entire courses and academic programs, that, in the long run, may have a pretty disruptive effect for academic units like EED; characteristically, the recent advent of Massively Open Online Courses (MOOCs) is a theme that must be carefully considered and investigated by the EED's leadership in terms of the novel dynamics that it can generate in the regional educational system and labor markets. In a similar but more general spirit, EED must carefully understand, characterize and monitor its regional competition; this is especially important given the current fluidity of the local markets and the broader economic environment, and also, the prevailing tendency for deregulation and a more competitive business environment.

B) Recommended Goals and Actions

Next we articulate a series of goals and actions that derive naturally from the previous SWOT analysis and, in the EEC's opinion, will help EED safeguard and strengthen its core value, and address its current and anticipated challenges. These goals and actions are organized in "short" and "long(-er)-term" activities.

I) Short-term goals and actions

1. Finalize the updated curriculum and effect the planned transition to the new program.

2. Institutionalize and strengthen the necessary procedures and policies that will support the objectives and the guidelines of the new curriculum, enhance the student participation in the academic courses and the broader departmental activity, and at the same time, prevent the development of certain student practices that can have a disruptive effect for the course instructors and the broader student body.

3. Institutionalize procedures for course evaluation and teaching effectiveness, and employ the obtained feedback for faculty assessment and continuous (curriculum) improvement.

4. Develop and strengthen the student advisement and career services.

5. Establish an industrial advisory board by leveraging the departmental alumni and the current industrial liaisons.

6. Support and further promote the EED participation in the ERASMUS program.

7. Explore and pursue the synergistic collaboration with other ATEITH departmental units, in terms of joint course offerings and shared facilities.

8. Revise and strengthen the curriculum content for topics related to project management, business administration and entrepreneurship.

9. Enhance the student motivation through invited presentations by the industry practitioners, and by an earlier (but structured) exposition of the students to some of the more applied sides of the curriculum.

10. Further promote the integration of modern information technologies in the course and the lab offerings of the unit, and in its administrative functions.

II) Long(-er)-term goals and actions

1. Better define and leverage the research potential and expertise of the departmental faculty

and labs.

2. Develop closer and better structured (strategic) research partnerships with the Electrical and Computer Engineering Department of the Aristotle University, and other academic units that relate to EED through past collaborations and affiliations, and/or common or complementary research activity and interests.

3. Establish tighter liaisons with the industrial base of the local region and of the broader geographical area, in terms of, both, student placement and R&D collaborations.

4. Explore the opportunity for the development of a graduate (MSc) program that will support the regional industry needs, capitalizing upon the departmental expertise.

5. Systematically investigate the opportunities, but also the potential threats, for EED that are defined by the current IT-related practices and the emerging (business) trends in higher technological education.

Finally, a strong prerequisite to the success of the aforestated goals is the provision by the Greek state of a rational, transparent and stable policy for the regulation of the national higher education in terms of admission policies, expected funding, and the governance of the various academic units.

The EEC has a positive impression of the overall state of the Department. The Committee feels that EED has been especially successful in the support of its educational mission, graduating students who are appreciative of their educational experience and, more importantly, they have addressed satisfactorily the needs of the local market. The quality of the EED students and graduates, and their positive disposition towards the Department, have enabled EED to establish strong liaisons with some companies of the public sector and the local industry, and, more recently, EED has also raised the interest of companies that come from the broader EU zone. Finally, EED has a very active participation in student mobility programs like ERASMUS, both, as a dispatcher of its students to EU academic institutes and companies, but also as a receiver and trainer of a significant number of students that come to EED from other countries.

The EED faculty is cognizant and proud of the quality of service they offer, and at the same time, they are willing and alert to safeguard and further promote EED's value in the face of the broader challenges that are experienced by the Greek state and economy. In particular, the EEC acknowledges the fact that the IER provides a pretty thorough analysis of the current situation of the Department, and it appreciates the engaging and positive climate that it encountered during its site visit. Furthermore, the draft for the new curriculum that was presented to the EEC is a very sincere and systematic endeavor to cope with important challenges and opportunities that are defined by the current structure of the Department and its operations, as well as by external factors like the recent legislative, economic and political developments.

Finally, the EEC also notes the facts that the EED infrastructure, in terms of facilities, administrative support and other services is in a very good shape, and that the Department also seems to enjoy a strong support from the Upper Administration of ATEITH.

While there are clear efforts and success in several ways, there is also a lot of space for improvement and significant opportunities that must be carefully addressed by EED in order to retain a leading position among departments of similar nature. The main themes of these opportunities have been detailed in the earlier parts of this report, and they can be summarized as follows:

- On the educational side, the large lingering student body that has been experienced in the past, partly for reasons that are beyond the departmental control and jurisdiction, must be recognized as a serious *anomaly* and be dealt with accordingly. Besides posing a serious threat for the EED viability under the emerging legislation, this set of students is a major disruption to the Department's operation (especially those concerning course offering, scheduling and examination) and severe waste of valuable resources. EED partly addresses this problem through the structuring of its new curriculum, but the EEC feels that additional controls must be set in place. These controls should include elements like a more structured student advisement process, the enforcement of a course-prerequisite structure through the course enrolment and examination process, the further coordination and rationalization of the examination process itself, and, ideally, a better control by EED of the student admission process.

- An additional issue that relates to EED's educational function and mission, but that will also have significant implications for the financial prospects and robustness of the unit, is the development of a graduate (MSc level) program. To ensure its viability, this program must carefully address particular needs and opportunities that are defined by the local and/or regional industry. Preferably, this program should be owned and run by EED, and be primarily stuffed by EED faculty.

- EED must also boost its current research activity, by better leveraging its internal capacity in terms of faculty expertise, lab facilities and professional recognition, but also by pursuing more structured (strategic) collaborations with its currently affiliate institutions and the local industry. The institutionalization of tighter connections with the departmental alumni and the regional industry by means of an external advisory board can be instrumental in helping the Department better "sense" the market, identify and secure research collaboration opportunities, place

graduates, but also maintain a modern and relevant curriculum.

- Equally important is the support of a faculty mobility program (e.g., in the form of sabbaticals) that will enable the EED faculty to visit and develop collaborations with academic and/or industrial "centers of excellence" in the areas of their expertise, and that will also allow educators and researchers from other institutions to visit and spend time in EED. Besides the personal faculty development that results from such extended visits and collaborations, a (more) strategic handling of this potential can function as a "booster" of EED's visibility, and as an important means for the conveyance and promotion of strong academic "values" and "culture".

- Finally, on the organizational side, the EEC feels that significant opportunity is defined by a careful examination of the synergies, but also the overlaps, that might exist among the modules and labs of the EED curriculum, as well as the course offerings and labs that are supported by other ATEITH Departments relating to EED (especially the Departments of Automation and Informatics, and the ATEITH units that relate to the supportive courses that are offered by EED on management and economics). A proper leverage of these synergies can result, for instance, in joint course offerings, common lab facilities, and the development of common research programs. All these practices are recognized as essential for the viability and competitiveness of most thriving engineering academic environments in the global community, and they become even more imperative in the prevailing economic conditions of the Greek state and higher education.

Closing this report, the EEC wants to reiterate the utter importance of the provision by the Greek state itself of a rational, transparent and stable policy for the regulation of the national higher education in terms of admission policies, expected funding, and the governance of the various academic units.

The Members of the Committee

Name and Surname   Signature

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