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HELLENIC REPUBLIC

H.Q.A.

HELLENIC QUALITY ASSURANCE AND
ACCREDITATION AGENCY

EXTERNAL EVALUATION REPORT

DEPARTMENT OF AUTOMATION

TEI OF THESSALONIKI

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External Evaluation Committee

The Committee responsible for the External Evaluation of the Department of Automation of Technical Institution of Thessaloniki consisted of the following five (4) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005 :

1. Professor Nicos Karcanias (Coordinator)

    Associate Dean Research, Professor of Control Theory and Design, City University London, United Kingdom

2. Dr George Drettakis

    Senior Researcher, Group Leader of REVES research group, INRIA Sophia-Antipolis, France

3. Professor Basil Kouvaritakis

    Professor of Engineering Science, University of Oxford, Oxford, United Kingdom

4. Mr Manolis Stratakis

    Expert, Director of Research, Forthnet S.A. Heraklion, Greece

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

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

Introduction

I. The External Evaluation Procedure

Dates and brief account of the site visit, description

Whom did the Committee meet?

The External Evaluation Committee (EEC) visited the Department of Automation of the Technological Educational Institute of Thessaloniki during the period of December 9th to December 11th 2013. The team arrived in the afternoon of December 9th and met the Chairman of the Department (Professor Nikos Konstantinidis), the Committee for Internal Evaluation (OMEA), the Vice Rector of the Institution and member of the Department (Professor Panagiotis Tzionas) and some of the faculty members (ΔΕΠ) at the Hotel. The Chairman gave a briefing about the profile of the Department, its activities/achievements in teaching as well as problems and concerns. Professor Tzionas explained the positioning of the Department within the Institution with respect to support services for research, student affairs and facilities. During this meeting the EEC discussed preliminary impressions over dinner.

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

Groups of teaching and administrative staff and students interviewed

Facilities visited by the External Evaluation Committee.

Before the visit, the EEC had some difficulties with the information provided by the Internal Evaluation Report. However, this was rectified by requesting additional and up to date information. A considerable number of documents were provided the next day, which included the following:

- The most recent internal evaluation data with corrections
- The updated list of publications
- Undergraduate Program Guide
- Information about the Department
- Faculty short CVs
- Statistics and data about the Department
- Samples of Final Year projects
- Samples of course notes and material
- Samples of examinations
- Samples of teaching evaluations
- List of Social Activities
- Student responses to feedback questionnaires

The atmosphere of the visit was professional and friendly with all participants expressing their views in an open manner. The Head of Department was very responsive and cooperative in providing requested information and making adjustments to the original schedule.

The EEC arrived at the Department on Tuesday morning (10th December), and visited the *Rector's office* where the vice-president of the school (and also professor at the Dept. of Automation) Professor P. Tzionas, together with the head of the Dept. Prof. N. Konstantinidis introduced the Technical University and the various administrative aspects. The EEC then moved to the meeting room at the Department where Prof. N. Konstantinidis continued with the introduction and a further discussion on various elements together with Prof. A. Gogoussis. The discussions were on undergraduate curriculum, the effort of the Department to develop postgraduate studies, laboratory and research activities. In addition the general problems faced by the Department were also discussed. The EEC visited the campus and had a tour of the main laboratories (facilities teaching and research). In particular, the *Laboratories* visited by the EEC included that of Digital Signal Processing, Hydraulics, CAD/CAM, Robotics, CNC and Electrotechnics. The EEC also visited several *classrooms* in action. Subsequently the EEC visited the *Departmental secretarial offices* and held discussions with the secretarial staff (two persons). This was followed by a meeting with the faculty in the departmental meeting room. Lunch was taken in the faculty restaurant, and members of the EEC visited the student dormitory and restaurant during the lunch break. The afternoon continued with further meetings with the faculty, including the technical faculty, followed by meetings with past students, research collaborators and finally a group of 10 students who were asked to volunteer for this purpose.

The meetings were well attended, informative and lively. The EEC discussed several issues of teaching and departmental life with the students and also asked several academic questions to determine the level of knowledge of the students.

On the second day, the EEC visited *one laboratory* session, and *one class*. In both cases, the discussions of the EEC with the students were extensive and were contacted without the presence of faculty members in order to encourage participants to discuss candidly all issues. The EEC also visited the *library* of the School and then returned to the meeting room for further discussion with Prof. Tzionas, Konstantinidis and Gogoussis. The EEC had an executive session to discuss and consolidate its first impressions, come up some preliminary set of observations, draw conclusions as well as enunciate some recommendations. The EEC then had a short meeting with the internal evaluation group (OMEA) members to brief them on the main preliminary observations and conclusions and get first reactions before departing . All groups were encouraged to communicate any additional comments to EEC via email by December 13th.

The EEC members are unanimous in expressing their appreciation for the cooperation and hospitality provided by the host Department as well as with the HQAA for arranging and supporting the visit.

II. The Internal Evaluation Procedure

Please comment on:

- **Appropriateness of sources and documentation used**
- **Quality and completeness of evidence reviewed and provided**

Before the visit to Sindos we had been sent the Internal Evaluation Reports for the years from 2008-09 to 2013-14 which were almost identical (with the exception of a few figures appearing in two tables). Therefore, for the purposes of our evaluation, we used the report for 2013-14. The report was competent and thorough, addressing the particular points identified in the ADIP template, but some aspects were not documented with the required backing of quantitative evidence. Most of these deficiencies were covered by supplementary documents that were provided subsequent to the submission of Internal Evaluation Reports. It would have been helpful if further evidence of how useful/relevant the education provided has been to graduates in their current employment. Also evidence concerning the extent of the department's involvement in joint projects with local industry, as well as the complete list of publications which should have been included in the report was presented to the EEC.

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

The objectives of the internal evaluation process as stated in the Internal Evaluation Report (IER) were met as far as the quality, relevance and nature of the educational program. The large number of accepted students and the shortage of staff make the task of achieving educational objectives very difficult. However, the teaching objectives are well met at the moment, but this is due to the enthusiasm and dedication of staff.

 The exposure of students to research is limited to the final year project and of course depends on its nature and could be improve if the Department were to run autonomously an MSc program. The potential for undertaking research and postgraduate teaching exists, but it is hampered by overloading and lack of funding.

The EEC felt that under a very difficult climate of lack of human and material resources, the Department manages to meet the majority of its objectives even though this comes at high cost in terms of time and resources, which we believe is reaching a critical level. It would have been useful, if a more systematic gathering of relevant information was included in the report.

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

APPROACH

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

The basic educational objectives of the Department are the development of an educational program that produces graduates with:

● Knowledge of the fundamentals of the science of Automation and up to date Automation Technology.

● Knowledge of the capabilities and skills that can be applied to the relevant industries.

● Good appreciation of the more general issues of manufacturing and general applications where Automation may be applied.

● Substantial practical training and application-oriented laboratory projects.

The overall program is divided into two streams at the moment: the Electronics Stream and the Electro-Mechanical Stream. There are plans to revise this classification into four streams which may enable a better satisfaction of curriculum objectives. The overall program has courses supporting the required general knowledge, courses related to specialization and optional courses providing further enhancement of general and specialist knowledge.

All technological courses have a well developed program of Laboratories which is well balanced with the corresponding Lectures. It is worth mentioning that there is a priority system for laboratories (those who have passed the theory can enroll to the Lab).

The goals and objectives of the curriculum are to provide a sound theoretical foundation in Automation and train engineers in its applications.

- **How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?**

The experiences of staff coming from both industry and academia have been the main factors contributing to the development of the program. Similar technological programs both nationally and internationally have been consulted. There is no real evidence on the direct impact of stakeholders on the development of the program. The EEC thinks it would be desirable to encourage input from industry through, perhaps, the establishment an Industrial Advisory Panel.

- **Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?**

The current curriculum is consistent with the objectives of the program but its more regular updating would be desirable.

- **How was the curriculum decided? Were all constituents of the Department, including students and other stakeholders, consulted?**

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

The revision of Curriculum takes place but not frequently enough. A new update of the curriculum is under development and a first draft was given to the EEC. We think that it would be good practice to set up an internal committee for updating the Curriculum with participation and input from all disciplines and stakeholders.

IMPLEMENTATION

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

The implementation of the Department's goal via the curriculum at the moment depends on the quality of leadership of the Department's Head. Establishment of an Internal Curriculum Committee (ICC) as well as an Industrial Advisory Panel (IAP) would create the right structure that may increase effectiveness.

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

The EEC was satisfied with the appropriateness of the curriculum and its compliance with accepted standards.

- **Is the structure of the curriculum rational and clearly articulated?**
- **Is the curriculum coherent and functional?**

The structure of the curriculum is well articulated and the proposed revision improves its coherence and functionality.

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

We have seen three books used as course material in the areas of Control Analysis and Design and Computing using MATLAB, which are of a good standard. It is our understanding that all Laboratory material is on *e-class*. There is strong evidence of general student satisfaction and support for the course.

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

The staff is extremely dedicated and has the appropriate skills to implement the curriculum. However, the Department faces serious difficulties due to a number of external factors. The increased number of students (as a result of the new system of accepting all new students in October), the retirements of staff, the lack of technicians and temporary staff (EDP, special technician personnel), the lack of adequately large classrooms, the need to use students for maintenance of equipment etc, the need to perform various bureaucratic tasks etc. Despite all these difficulties the department manages to ensure high quality of teaching and student satisfaction but this is based on the commitment and enthusiasm of both sides and this situation is definitely not sustainable. The ECC recognizes the significance of these difficulties and considers that such under resourcing may have serious implications on the delivery of a good curriculum that responds well to the needs of its stakeholders and society.

RESULTS

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

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

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

The Department has succeeded in achieving all its goals and objectives with respect to undergraduate teaching. The development of an MSc in Automation has not yet been realised despite the Department's efforts. This is due to restrictions imposed by the existing framework for the development of postgraduate courses in Technological Institutions. The lack of existing framework for research studies and the loading of staff has not been helpful in developing their research objectives. Similar difficulties exist with respect to Doctoral studies, which at the moment are addressed by the individual members of staff who participate in programs of joint supervision with colleagues from institutions who can award research degrees within the existing legal framework.

IMPROVEMENT

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

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

Although there are no formal committees for assessing the need for improvements of the curriculum, the experience of many staff members with current industrial applications and the good communications between staff is a factor that counterbalances the lack of the relevant management structures. A new curriculum is being developed and exists in a first draft form. However, it would be desirable for this process to be formalised by developing an Internal Curriculum Committee (ICC). The role of such committee should be to monitor developments, integrate student feedback and interpret the input of the Industrial Advisory Committee (IAC) relating to curriculum development. The Department plans to expand teaching in the postgraduate MSc level in the area of Automation. The EEC supports this initiative, and believes it will have positive implications.

B. Teaching

APPROACH:

Does the Department have a defined pedagogic policy with regard to teaching approach and methodology? Please comment on :
- **Teaching methods used**
- **Teaching staff/ student ratio**
- **Teacher/student collaboration**
- **Adequacy of means and resources**

During our visit we had the opportunity to witness some of the teaching practices of the department, we spoke to several groups of students (in differing group numbers and different circumstances) and alumni, we interacted with the teaching staff and were shown the teaching facilities as well as inspected some of the teaching material that is available to students. We found that the department's practices are based on a sound pedagogic policy and ranged from good to excellent. In particular we felt that instruction during the course of learning in laboratories was of a very high standard and that the level of support and collaboration offered to students by the academic staff was commendable. It could be argued that the provision of tutorial sessions for the students, the practice of which has been prohibited by human resources considerations, would enhance their academic progress.

We were particular struck by the very positive and mature comments made by the students in respect of their teachers and their general educational experience in the department. However it appears to us that there is a very pressing need for larger lecture theatres: the maximum of 63 available seats to accommodate classes that at times can exceed the number of 200 is woefully inadequate and, apart from the obvious objection of students having to attend lectures standing and squashed, it almost certainly is a concern from the safety perspective. There would be carnage if there were a serious accident (e.g. fire) and we are not at all certain who would then carry the responsibility. Also laboratory sessions tended to be overcrowded which inevitably meant that students had to work in large groups. In one instance we saw groups as large as 6 working on the same experimental apparatus. In our opinion more funding is required if this totally unacceptable education practice is to be avoided. The equipment is inadequate both in terms of numbers and reliability. The lack of technical staff responsible for the maintenance of equipment makes matters worse. The situation where the department attempts to generate equipment through the recycling of apparatus that students built for their final year project sounds positively Dickensian. It is completely unacceptable that students have to pay to do their work since education is supposed to be free. In a number of instances staff resorted to experimentation by simulation rather than offer the opportunity for the full experience.

We think that the 6 month placement within industry in the students' final year is proving very useful both in terms of providing the students with the requisite industrial experience, but also in terms of providing a point of contact between the department and local industry. The latter provides employment prospects for the graduates as well as opens channels for possible research collaboration between the department and local industry.

- **Use of information technologies**

Information technology is used in two main areas of teaching. The first is the e-class platform

that allows teachers to share documents and presentations with the students, who can access this material at home or from computers in the library. The e-class platform also has interactive facilities such as a discussion forum, which is used by some professors to address student questions. These forums are also used by students to help each other. The second IT platform is the *Pythia* platform, which is a University-wide online system for support of grading and recording results, as well as providing other information, such as faculty publication lists etc. The EEC was informed that the *Pythia* system is in the process of being upgraded and will have several additional capabilities, most notably the support for student evaluation questionnaires and the analysis and statistical processing of results. The department web site is the central access point for both services, in addition to its support for research dissemination (see also below).

- **Examination system**

We inspected past examination papers with sample answers from the students giving indications of the marking scheme and found them to be perfectly acceptable. We also examined final year project reports and were given an indication of the mark awarded to each. The process appears to be perfectly satisfactory but felt that often the inclusion of relevant references was not complete and in some instances the validation of the results with experimental data was absent. We understand that the reason for this is that students provide this validation during their oral presentation to the panel of three examiners. We were made aware that the supervision of projects is not necessarily conducted on the basis of weekly meeting, or regular intervals We believe that instituting such a process would be beneficial both in providing guidance to students and giving the opportunity for academic staff to monitor more closely the progress of students. Two more issues worthy of mention relate to the "inflation" of the final year project marks and the lack of internal and external moderation of the examination process; both these issues are discussed further in the RESULTS subsection.

IMPLEMENTATION

Please comment on:
- **Quality of teaching procedures**
- **Quality and adequacy of teaching materials and resources.**
- **Quality of course material. Is it brought up to date?**

As discussed under the heading of "Approach" the teaching procedures were found to range between good to excellent and the quality and adequacy of teaching material provided by the staff is good. The resources, due to insufficient funding, appear in parts to be poor both in terms of quality and quantity. Students are provided with notes and reading lists as well as material that is posted in the electronic facility "*e-class*". Updating of the material appears to be undertaken continuously but we felt that the oversight of this process is left to the individual members of academic staff; a more formal procedure undertaken by appropriate panels (of the staff most relevant to the subject matter of a particular course or lectures/laboratories) could be beneficial.

- **Linking of research with teaching**

The main link of research with teaching is the final year projects and the final year (industrial) placement (or internship), when the latter takes place in research laboratories. These placements or projects are often on a topic related to the research (or applied

research) interests of faculty members, and can be conducted within the context of a research collaboration. The case of several placements in the CERTH research center was mentioned during the visit of Dr. Voutetakis (who runs a research group at CERTH). Evidently, in the case of postgraduate (co-) supervision, research is directly linked with teaching.

- **Mobility of academic staff and students**

The internal evaluation report provides information on mobility of staff and ERASMUS exchanges of students, but this is largely anecdotal lacking particular detail. Discussions during our visit corrected this, but the collection and written presentation of such details would have been more useful.

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

The original internal evaluation report makes special mention of the collection of student responses to feedback questionnaires for each course delivered, but reports that the data, due to lack of secretarial assistance, was not entered in any electronic facility and therefore was not analysed. However, basic statistics on the distribution of examination marks was presented during our visit. We understand that the difficulty of data collection/analysis has now been overcome, but feel that this process is not yet sufficiently formalised, and in particular it is not obvious what is the practice in terms of correcting deficiencies highlighted by the student responses. In addition we think that, useful as this process might be, it surely cannot be the only way in which quality of teaching is evaluated. Oversight by relevant panels of academics might be helpful in this respect but also some independent evaluation (by an accreditation panel for example) is perhaps essential.

RESULTS
Please comment on:
- **Efficacy of teaching.**

Student feedback is extremely positive about all aspects of teaching however the examination results appear on average to be on the low side. A contributing factor to this is, undoubtedly, the intellectual content and the breadth of the course and in particular the significant mathematical demands (for some of the courses) which are not well matched to the qualifications of the students being admitted to the Department. Exceptionally, the average mark for final year projects is very high indeed and this reflects the amount of effort applied to this aspect of their course by the students, but appears to us to inhibit differentiation in the assessment of the quality of projects.

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

The percentages of success rates in examinations is generally rather low, ranging from the low twenties (e.g. Mathematics II, Microcontrollers, Physics I) to the high nineties (mostly in laboratories). There is a possibility that this discrepancy is due to a certain "hidden" continual assessment element in the evaluation of laboratory work, but generally there does not appear to be a process whereby results are normalized (to produce more uniform distributions), nor did we witness a process whereby the sources of discrepancies are scrutinized with the view to initiating action for their eradication. In addition, there is

freedom in deciding whether assessment should be performed by oral or written examination which perhaps exacerbates the situation. Aiming for particular distribution of results seems to us to be a possible way forward but that clearly cannot be implemented without a system of "external examiners" that oversees the retention of academic standards.

- **Differences between students in (a) the time to graduation, and (b) final degree grades.**
- **Whether the Department understands the reasons of such positive or negative results?**
-

Both faculty and students provided much insight into the reasons for these differences.

Time to graduation. The number of students who graduate on time is minimal (<4%), and the number of students that take longer than 5 or even 6 years is very high (close to 80%).

The explanations provided were numerous. Among others (a) the non-compulsory nature of theoretical lectures (as opposed to laboratories for which presence is compulsory and those without required presence fail) (b) the fact that many student effectively stop attending, and thus increase the duration statistics artificially since they are not removed from the list of registered students. An additional reason given for the drop out rate is the mixed quality of students entering the Department, most notably students from technical high schools who lack basic mathematical training (but whose admittance at a given percentage is required). (c) Many male students perform their military service during their studies; the correct procedure is to interrupt the studies (thus not affecting statistics) but this is not always the case. It is also unclear whether statistics take into account the cases of those who do interrupt. (d) From the interviews with the students, the EEC found that a significant percentage of students have to work part time to be able to make ends meet financially. From three informal "show of hands" surveys during the visit, this percentage ranged between 20%, to 70% depending on the group of students. (e) Hitherto no limits have been stipulated on the allowed duration of studies and this may have been a contributing factor to the variations in the time to graduation; the committee understands that new legislation will eventually eradicate this anomaly.

Final Degree Grades. The average grade of the diploma for the last five years was 6.45 (out of 10) and is considered to be low side. Further analysis of grades per course indicates a clear distinction between laboratory courses (which often have an average grade above 7 or even 7.5) and theoretical courses which often have an average grade between 5 and 6 (for example mathematics I, II and II, 5.8, 5.5 and 5.9). Students can retake examinations many times and on account of this some students do not take the examination seriously, thereby causing the average mark to drop.

A further possible consideration that may explain disparity in average grades may concern the differences that exist in the examination process which includes evaluation by oral examination, or written examination, or written examination with assessment of laboratory work.

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

The Department is updating the curriculum at intervals but may need more formal

procedures for determining the syllabuses, learning outcomes, processing student feedback and acting upon its findings, monitoring trends in examination results and generally inviting an external element to their evaluation process. We understand that the Department is aware of these issues and is in the process of revising some of their practices.

C. Research

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

APPROACH

- **What is the Department's policy and main objective in research?**
- **Has the Department set internal standards for assessing research?**

In the internal assessment report, the department stated that its research policy was defined as "the individual interests of the faculty". The main objective is not clearly defined, but the implication is that the objective is to pursue scientific and research interests of the faculty. The assessment process listed was the standard list of publications and citations to the publications of faculty members.

IMPLEMENTATION

- **How does the Department promote and support research?**
- **Quality and adequacy of research infrastructure and support.**

This is an area which seems to us to be neglected and relies entirely on the general recognition of the importance of the research.

The lack of funding perhaps explains the inadequacy of the infrastructure in support for research. However, the ECC recognises that similar problems are encountered in many other Technological Institutions.

- **Scientific publications.**
- **Research projects.**
- **Research collaborations.**

The presentation of the elements concerning publications, projects and collaborations in the original report was incomplete. As mentioned earlier, this information was adequately complemented during the visit.

In terms of basic indicators, approximately 40% of faculty (according to the report) are involved in research activities. The supplementary numbers provided for the period 2009-2013 indicated that there were 9.7 publications per faculty member (4.41 journals and 5.29 international conference with reviews), thus almost 2 publications/year/faculty. The total number of such publications from the department over this period was reported was around 150, plus 4 books. The total number of citations was 1318 total, and 77.5 per faculty member over the five year period.

In terms of research projects, the majority of the research activities of the department are part of the ARCHIMEDES I and II local research initiatives, and are nationally funded by the Greek Ministries (GSRT - ΓΓΕΤ). There are also a few EU-funded projects (mainly involving 2-3 faculty members), as well as projects from nationally administered European funds (NSRF - ΕΣΠΑ).

One interesting project involves an NSRF project with the local elevator company Doppler, which was mentioned on several occasions during the visit. Another which started recently concerns measurements in a local photo-voltaic installation.

The research collaborations of the department are within the context of the above projects for the most part.

RESULTS
- **How successfully were the Department's research objectives implemented?**
- **Scientific publications.**
- **Research projects.**
- **Research collaborations.**

Given the nature of the faculties teaching duties, the administrative and technical difficulties mentioned elsewhere in this report and the lack of postgraduate students, the research activity of the faculty in terms of the *quantity* of research production can be considered satisfactory. The publications listed in the documents provided during the visit include several top-notch international publications both in journals (Physics Letters, IEEE Transactions, ACM Transactions) and conferences (IFAC). Nonetheless, the percentage of these high quality publications could be improved. The EEC hopes that the number of high-quality publications will increase in the future, especially if the various current negative surrounding conditions (see above and elsewhere) are improved.

The list of research projects and collaborations, again given all the aforementioned obstacles, is good. Larger involvement in EU-level project would be desirable, but the EEC recognizes that further means (travel budgets etc.) need to be provided to allow the realization of such a goal.

- **Efficacy of research work**

The evaluation committee had a major problem in terms of the aspect of efficacy of research work because the publications figures recorded in the internal evaluation reports were judged to be well below what might be acceptable. Upon our visit however we discovered that this was an error, mainly due to a hitch in the collection of data. The new figures were updated and improved tenfold and are perfectly adequate covering a range of journals/proceeding some of which are A* rated and others which are more informal that do not have any international standing. As is usual in most departments, contributions to publications are not evenly spread across all members of staff, the majority of the contributions involving the names (together of their co-authors) of only about half the academic staff. However the research activity is considered to be important in the department and all their recent recruits are or have the ability to be research active.

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

Members of the Department have been granted a European Patent (EP 1919817) entitled "Rigid Telescopic Mechanism" and a European Mechatronics Award 2013, in the framework of Strainwise research project.

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

The main improvement requested by the department in the internal report is the creation of a postgraduate program (Masters at first, possibly leading to a Ph.D. program in the future).

The current legislation (before this evaluation) did not allow the creation of an independent postgraduate program, and this restriction has been a major limitation.

Despite this, the Department has taken several initiatives in the past to create joint Master's programs with other University-level departments, some of which were unsuccessful and one (with the University of Aegean) successful.

The Department has also encouraged participation in research projects etc.

D. All Other Services

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

APPROACH
- **How does the Department view the various services provided to the members of the academic community (teaching staff, students).**
- **Does the Department have a policy to simplify administrative procedures? Are most procedures processed electronically?**
- **Does the Department have a policy to increase student presence on Campus?**

The Department operates within the School of Applied Technology of TEI (ΣΤΕΦ), sharing many supporting facilities with other departments such as the library, career office, refectory, information services, etc.

The library which is split in three different buildings serves the whole Institute. There is also a career office that should support connection links with industry for practical experience placements and professional work, however there was no evidence of its efficacy.

The e-class service is used extensively by the students. Some professors even use the forum function of e-class, thus making the lecture more interesting and interactive for the students.

Apart from e-class and Pythia services there was no evidence of other IT initiatives to simplify administrative processes.

Due to the remote location of the TEI (20Km from Thessaloniki city center) and the scarce bus routes (ΟΑΣΘ), there is an obvious difficulty for the students to commute everyday and especially early in the morning (lectures start as early as 8:15'), or stay till late afternoon/evening. An extra consideration that exacerbates this problem relates to the fact that a considerable proportion of students has to undertake part-time paid employment.

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

- **Form and function of academic services and infrastructure for students (e.g. library, PCs and free internet access, student counseling, athletic-cultural activity etc.).**

The EEC had the opportunity to visit the Department's Administration Office, the Library,

the faculty and student Restaurants, many classrooms and laboratories and a large part of the campus. Most of the buildings are old and have some obvious functional limitations. It is very sad that central heating was not widely available, so in the winter students must have their coats on during lectures. Also classroom space is spectacularly inadequate, often leaving standing room only for students to attend a lecture.

The EEC did not visit the network operation centre, nor did it visit the career office. The internet access facilities were examined and were found to be satisfactory. The departmental web pages were also inspected and it was recognized that they need updating and general improvement.

The various services provided to the members of the academic community are overall viewed as basic but their use is efficient. Within the available resources and budget, considerable effort is made to support the students.

The Department's main administration office is staffed by two secretaries. The office is open to the public/students between 11 am - 1 pm every day of the week, however this time window is considered to be insufficient.

It would be desirable if electronic support were provided in connection with enrolment, module registration, applications and requests for documents.

The career office appears to be active with the Erasmus Program. The department maintains Erasmus agreements with eight Universities across Europe. The EEC was informed that approximately 20 students have been exchanged during the last five years from the Department.

RESULTS

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

During discussions with staff and students specific issues around the delivery of support services were raised. It became apparent that the Department does not consider the provision of support from the administrative services to be adequate.

It was felt that the secretarial staff was not under the immediate direction of the Department. The EEC believes that this service should answer directly to the Head of Department.

The Department appears to be well acquainted with the aforementioned deficiencies but feels impotent in respect of bringing about the required improvements.

IMPROVEMENTS

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

The Department recognizes the need for the update and improvement of the web site, however, it feels unable to propose initiatives in this direction in view of the current financial climate. The support staff for the internet facilities is insufficient (2 people for a 20,000 person institution). Further funding must be provided for this.

The same applies to the pressing issue of student transportation, careers development,

student enrollment and assistance with student placements.

Collaboration with social, cultural and production organizations

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

It has emerged during discussions with the staff that both the Department and the Institution as a whole are involved annually in numerous activities which encourage social and cultural interaction with the local society and organizations (e.g. presentations in local press, TV and radio, conferences and information days, career days, talks at local high-schools). This process should be organized more formally, should be centralized and should be better supported by the Department and the Institution.

Departmental research facilities are in the process of being accredited with the view to being licensed for the provision of external services. This will certainly increase the Department's connection and collaboration with the local society and the above mentioned organizations.

E. Strategic Planning, Perspectives for Improvement and Dealing with Potential Inhibiting Factors
For each particular matter, please distinguish between under- and post-graduate level, if necessary.

Please, comment on the Department's:

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

The EEC did not come across a written *Strategic Plan per se*; however the internal evaluation report presents issues relating to a *Development Plan*. The Internal Evaluation Report implicitly defines objectives for the Department and identifies the potential inhibiting factors. The major objectives may be summarized as follows:

♦ Improvement in the quality of the graduates of the Department;

♦ Expansion of the research activities;

♦ Establishment of graduate programs.

The development of plans of the Department is inhibited by a number of factors mostly at the State and Institutional level.

At the State level: The overall *legal/operational framework* for development of postgraduate studies and research for Technological Institutions has been a strong inhibiting factor for:

(i) Lack of professional rights to the institution's graduates as described by the law. As a result, the institution becomes less attractive to potential students. It appears that compensatory legislation on this issue has been pending for a number of years. We strongly encourage the appropriate authorities to act on this.

(ii) Lack of funds towards recruitment of staff supporting technical, administrative and R&D

roles. This includes a disproportionately low fraction of R&D budget allocation to the Technological Education Institutes when compared to universities, and a lack of funds to replace faculty members who retire;

(iii) The legislation framework that does not allow the Department to offer post-graduate degrees and establish and operate research laboratories. This affects the ability for Technological Institutions to provide services and this raises an additional requirement for funds so that the Department can meet its operational needs;

(iv) The current restrictions on the replacement of retired staff ;

 (v) The complexity of purchasing procedures even for small items.

The implications of the above go beyond the inhibition of development of research for Technological Institutions. Lack of MSc and research students restricts the availability of additional manpower that can provide tutoring services for undergraduate teaching (MSc, research students), supporting undergraduate tutorials, the size of laboratory classes (smaller laboratory classes) and project work. The current restrictions on the replacement of retired staff creates additional problems in delivering the very good educational standards the Department is willing to provide.

At the Institutional level: We have realized that a number of inhibiting factors such as: (i) The current practice where the secretarial support is under the control of the central institutional administration, restricts significantly the ability of the Department to undertake initiatives at all levels and increases the load on those in the Department with Academic management duties. (ii) The lack of budget at the Department level even for small items. (iii) The lack of resources for the central IT and web team creates obstacles in the development of a departmental website of the required standards. (iv) The lack of support from the Central Marketing team in developing a proper industrial/stakeholders network for student placements and development of applied research. (v) The lack of large classrooms for the teaching needs of the Institution.

At the Departmental level: Inhibiting factors at the departmental level emerge due to: (i) A shortage of staff and especially technicians for laboratory work; (ii) The lack of a budget for a day to day operations; (iii) The perception of many in the staff that there is no room for any initiatives due to the legal framework and administrative practices.

It is the view of the Committee that the aforementioned inhibiting factors are significant and need to be addressed at the State level. Until the legal environment changes, the Department would have to function as it has, making the best of a bad situation. Having placed the Universities and the Technical Education Institutes at the same educational level, the State needs to clarify some contradictory features that have emerged since the transition of the Institutes from "higher" to "highest" educational institution status.

- **Short-, medium- and long-term goals.**
- **Plan and actions for improvement by the Department/Academic Unit**
- **Long-term actions proposed by the Department.**

During the discussions with the EEC, the department listed the following short-, medium- and long-term goals:

Short term: The first and immediate concern is surviving the cuts and the current economic crisis. Among other direct consequences of these cuts is the drastic reduction of temporary teachers available (from ~35 to ~6) which have overloaded current professors who often perform unpaid additional teaching duties, the lack of funds for consumables for laboratory exercises, shortage of space due to the large number of students admitted (and transferred from other departments) etc. The department has been coping with this situation, thanks only to the commitment of its staff, and a very supportive and determined student population. The second most important short term goal is the process of updating the curriculum, which was started approximately two years ago. This process has been delayed for several administrative reasons beyond the control of the department. However, the procedural and administrative difficulties will hopefully be overcome soon, and thus this process will be completed.

Medium term: The main medium term goal is the development of an independent postgraduate Masters program in some area of Automation and Control. This involves amongst other issues, the detailed definition of a plan for the Masters curriculum, the consequent potential adaptation and/or rationalization of the undergraduate curriculum, market research and identification of competition from other Master courses, identification of potential students to be registered in the course, quantification of the needs of the Greek economy for such a course and the potential of charging fees at the appropriate level and estimation of implications on staff loading.

Long Term: The long term goals are the maintenance of the highest possible quality of education, and in particular taking into account the constant technological and scientific evolutions in the process. If the problems of student/staff and student/space ratios are overcome, the establishment of tutorials and smaller laboratory exercises will also contribute to this process. In terms of research, the creation of a Ph.D. program is definitely one of the long term goals of the department.

F. Final Conclusions and recommendations of the EEC
For each particular matter, please distinguish between under- and post-graduate level, if necessary.

The overall assessment of the Department, as informed by this evaluation procedure, is very positive and in particular the EEC found the members of the Department to be well motivated and committed to deliver high quality education in respect of the relevant engineering skills. The curriculum addresses well the requirements of industry. The learning and training of graduates is underpinned by high quality laboratory work delivering the educational mission of the Department to provide practical experience to their graduates.

The overall student experience is very positive as it has been manifested during the meetings with current students and alumni. Based on the discussions with the students it appears that the Department is in good rapport with their cohort and this is attributed to the attitude of the members of the staff, who show enthusiasm, and a high level commitment. Evidence of collegiality among the faculty and commitment to the common task of promoting the Department's profile was also evident during the visit.

The faculty is active in outreach activities with the view of establishing links with other institutions in order to underpin teaching and research (such as an effort to develop an MSc project with Universities of Thessaly and University of Aegean and the research co-operation with the Centre for Research and Technology Hellas (CERTH), Thessaloniki). The academic staff foster enthusiasm for and commitment to the process of educating the young and this translates into a positive student experience.

The Development Plan for 2013-2014 has clearly articulated goals and strategies centred around the needs to overcome deficiencies in the areas of:

■ Lack of a dedicated building with appropriate spaces for the Department

■ Lack of administrative support for the processes of the Department.

■ Large number of staff with no permanent contracts

■ State Framework difficulties in establishing an MSc course, a Doctoral program of studies

A significant number of issues discussed during the visit of the External Evaluation Committee related to the ambiguous status of the Technical Education Institutes in the domain of the tertiary education. By law, they are considered institutions of higher education at the same level as universities, nevertheless they are treated differently particularly with respect to the allocation of resources and the activities they may undertake. It is absolutely urgent that the State has to clarify the exact role and differences of the various tertiary education establishments. Are the Technical Education Institutes equivalent to universities or not? If they are, there should not be any distinctions in the education and research activities and they should be allowed to act as true equivalent institutions. If they are not judged to be equivalent, the State should clarify their respective roles and distinguish the requirements for appointments to their faculties in order for the Technological Education Institutes to be able to develop their programs within a clearly defined framework. In either case, the funding of the Technological Institutions has to make provisions for their proper support in both teaching and applied research.

 Central to this debate on the different roles (if any) in the tertiary education is the need to separate the evaluation of the teaching quality and from that of research quality, although research always has significant impact on teaching. Research evaluation requires appraisal of all academic members of staff and proper evaluation of research in terms of performance indices and other indicators.

As a result of this evaluation process and in particular of our visit, the EEC believes that this department has the potential to provide a very useful service to society, by delivering high-quality education and (potentially applied) research while being in close contact with the true needs of industry and production. Given adequate means, this Department could be an example of how the TEI could truly and concretely contribute to Greek society, by linking Higher Education and Research with the Industry and real applications. To accomplish the above, we make the following recommendations, in addition to several points raised elsewhere in this text:

Recommendations

The State should:

♦ Revise the Higher Education Act to clarify the role of the Technical Education Institutes in order for them to be able to develop to their full potential. The relevant legislation on this issue has been pending for a number of years. We strongly encourage the appropriate authorities to act on this.

The Institute should:

♦ Develop a strategic plan that defines its mission as a unique institution and sets forth broad institutional objectives to define the framework to be used by the Departments in developing their own strategic plans. The Department of Automation should formulate a strategic plan that defines educational and research objectives particularly in respect of the role its graduates will be expected to play in the Greek economy

♦ Provide (together with the State) all required support for creating the required space for the Department.

♦ Develop the Careers Advice Unit to support further the required networking for finding appropriate student placements.

♦ Further develop and support the IT services required for website development.

♦ Develop a mechanism for allocating a budget to the Department and   make an effort to simplify unnecessary administrative and purchasing processes.

The Department should:

♦ Steer the strategic plan towards a recognition of the distinct features of their graduate program as opposed to those of other Universities and identify the uniqueness of the post graduate program they wish to develop; this also involves consideration of objectives to be achieved, identification of the targeted audience, the completion of a thorough market research, consideration of loading issues and identification of competitor courses and development of a distinct identity.

It is hoped that the State will provide the legal framework and the material and human resources to allow the Department to establish independent postgraduate studies, starting with a Masters program, and continuing with the establishment of a Ph.D. program in the future.

♦ Establish a committee to oversee the update of the curriculum in regular intervals with a view to responding to developments in the technical field, as well as the feedback provided by the responses to students' questionnaires.

♦ To develop a strategy addressing the problem of students prolonging their studies due to financial difficulties.

♦ Develop a formal mechanism (such as Wold-Wide Web and social media) for maintaining contact with its alumni. Such a mechanism would provide feedback for improving the educational program, help with the employment of graduates, increase visibility and enhance the image of the Department in society at large.

♦ Develop an Industrial Advisory Panel to advise on the required changes on the curriculum, enhance the opportunities for student placement and development of applied research.

♦ Expand and strengthen its links with industry to reinforce its R&D activities and enhance the profile of the Department. This should start by formalizing the existing relationships with the various local companies, the companies involving graduates of the department etc. and expand at a national and hopefully European/international level.

♦ Develop a strategy to encourage and motivate research and stir the future recruitment towards the appointment of research active staff.

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TECHNOLOGICAL EDUCATIONAL INSTITUTE OF THESSALONIKI

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