



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Α.ΔΙ.Π.
ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ ΚΑΙ
ΠΙΣΤΟΠΟΙΗΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ
ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC
H.Q.A.A.
HELLENIC QUALITY ASSURANCE AND
ACCREDITATION AGENCY

EXTERNAL EVALUATION REPORT

SCHOOL OF SCIENCE AND TECHNOLOGY

HELLENIC OPEN UNIVERSITY

OCTOBER 2013



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External Evaluation Committee

The Committee responsible for the External Evaluation of the School of Science and Technology of the Hellenic Open University consisted of the following four (4) expert evaluators drawn from the Registry constituted by the HQAA in accordance with Law 3374/2005:

1. Professor Dimitris Coucouvanis, University of Michigan, USA (Coordinator)
2. Professor George Michailidis, University of Michigan, USA
3. Professor Konstantinos Plataniotis, University of Toronto, Canada
4. Professor Charalambos Tsertos, University of Cyprus, Cyprus

Introduction

I. The External Evaluation Procedure

- *Dates and brief account of the site visit.*
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II. The Internal Evaluation Procedure

Please comment on:

- *Appropriateness of sources and documentation used*
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-

The External Evaluation Committee (hereafter referred to as the “Committee”) visited the School of Science and Technology (hereafter referred to as the “School”) of the Hellenic Open University (hereafter referred to as the “University”) in Patras between the 14th to the 16th of October 2013.

The Committee visited the HQAA’s headquarters in Athens on Monday morning (October 14, 2013). The Committee was briefed on University’s operations and its evaluation mandate. Following that, the Committee arrived in Patras on October 14th, 2013 and had an initial meeting at the University Campus in Perivola with the President of the Board of Directors Professor Coccosis, the Dean of the School of Science and Technology Professor Hadjinicolaou, the Associate Dean of the School of Science and Technology Professor Kalles and the Chief Business Officer of the University Mr. Rodopoulos. During this meeting, several aspects of the University’s operation were discussed with particular emphasis on the distance learning approach practiced by the University, its open student admission policy, its enrollment to study programs, and University’s operational procedures regarding coursework, exams, student counseling, learning material, academic staffing / recruitment. Finally the President and the Chief Business Officer presented the Committee with a brief account of the University’s “vital statistical data” and its growth prospects.

On the evening of October 14, the Committee had a follow-up extensive discussion with the Dean and the vice-Dean of the School, in a typical classroom, at the University premises, covering generic aspects of the School’s mission, its undergraduate and postgraduate programs, as well as the typical student and tutoring activities throughout an academic year. As the Dean of the School also serves as Head of the University Library Committee, she also offered an overview of the library’s infrastructure, staff and services.

On the morning of October 15, 2013, the head of the Internal Assessment and Training Unit (IATU) of the University, with the support of three IATU personnel, provided an overview of the procedures followed in the calculations of the quantitative and qualitative indices utilized when the performance of the various School programs is evaluated.

Following that, the Committed reviewed the PLI, PLS and SDY study programs (hereafter, the course modules acronyms used correspond to the transliteration from the corresponding program acronyms in Greek to Latin. See the Appendix for a complete list of the program's acronyms and their original Greek nomenclature).

As per usual practice, a typical study program review started with a short presentation delivered by the program director. For each program the Director's report focused on the a) program's aim and scope, and b) information on the structure of the program, the educational material that was used, and the educational methodology followed for attaining the prescribed learning outcomes. For each of the reviewed programs, the Director of the program was accompanied by the coordinators of the program's modules and other teaching faculty. When needed, clarifications, input, and remarks regarding the University regulations and the School's administrative procedures were provided by the Dean and the vice-Dean. Following each program review, the Committee had a short discussion with School academic staff appointed to the study program under review. The Committee held "in camera" meetings with students and/or alumni of the programs under review. The review procedure described above was followed for all program studies under review.

On the afternoon of October 15, the Committee visited two key School facilities on-site, namely the new super-computer center facility to be used by the physics program faculty, and the human-computer interaction laboratory. It was also given access to faculty offices and its members tour a typical office of an University academic staffer. Later that afternoon, the Committee reviewed the FYE, PSF and KFE study programs and, subsequently, arrived in the down-town campus, where it visited the FYE program's educational laboratories on the subjects of Biology, Chemistry and Physics, the Digital Systems laboratory, as well as a research test place for Detector and Electronic equipment for High-Energy Physics Experiments. During the lab visit, the Committee met with lab personnel, two PhD students and two post-doctoral students.

Throughout October 16, the Committee held numerous meetings at the School's conference room in the down town campus and reviewed in sequence the following study programs: MSM, KPP, DIA, PSE, PSP, DCHT, SMA and DIP. Late afternoon on October 16, the Committee met with administrative personnel and held a closing meeting with the Dean and vice –Dean prior to departing for Athens. Lastly, on October 17, the Committee visited the Athens offices of the University and had a plenary meeting with 27 students and alumni of various School study programs.

For reference, from October 14, 2013 to October 16, 2013 the Committee met with:

- The President of the University
 - o Professor Haralambos Coccossis, School of Planning and Regional Development, University of Thessaly, president@eap.gr
- The Dean of the School
 - o Associate Professor Maria Hadjinicolaou, School of Science and Technology, Hellenic Open University, hadjinicolaou@eap.gr
- The vice-Dean of the School
 - o Assistant Professor Dimitrios Kalles, School of Science and Technology, Hellenic Open University, kalles@eap.gr
- The Secretary of the University (Chief Business Officer)
 - o Mr. Charalambos Rodopoulos, grammateas@eap.gr
- The head of the IATU of the University (member of School faculty)
 - o Associate Professor Michalis Xenos, School of Science and Technology, Hellenic Open University, m.xenos@eap.gr
- Three (3) members of the IATU team (2 PhD holders and 1 MSc holder)
- All tenured/tenure-track members of School faculty:
 - o Professor Spyros Tzamarias, tzamaria@eap.gr
 - o Associate Professor Maria Hadjinicolaou
 - o Associate Professor Michalis Xenos
 - o Associate Professor Vasilios Verykios, verykios@eap.gr
 - o Associate Professor Ioannis Kalavrouziotis, ikalabro@eap.gr
 - o Associate Professor Efthimios Zervas, zervas@eap.gr
 - o Associate Professor Achilleas Kameas, kameas@eap.gr
 - o Associate Professor Georgios Hatzigeorgiou, hatzigeorgiou@eap.gr
 - o Assistant Professor Dimitrios Kalles
 - o Assistant Professor Foteini Kariotou, kariotou@eap.gr
 - o Assistant Professor Anastasios Dagiuklas, dagiuklas@eap.gr
 - o Lecturer Kyriakos Bourikas, bourikas@eap.gr
 - o Lecturer Nectaria Gizani, ngizani@eap.gr
 - o Lecturer Antonios Leisos, leisos@eap.gr

- All Directors of (the 14) School study programs, 8 of which are members of School
- faculty and 6 of which are members of faculty at other Universities (one of them travelled from Thessaloniki and another one from Ioannina):
 - o Professor Spyros Tzamarias, FYE Director
 - o Associate Professor Maria Hadjinicolaou, MSM Director
 - o Associate Professor Michalis Xenos , PLH Director
 - o Associate Professor Vasilios Verykios, PLS Director
 - o Associate Professor Ioannis Kalavrouziotis, DIA Director
 - o Associate Professor Efthimios Zervas, PSE Director
 - o Associate Professor Achilleas Kameas, SDY Director
 - o Associate Professor Georgios Hadjigeorgiou, DCHT Director
 - o Professor Alexios Lykourgiotis, KPP Director, School of Chemistry, University of Patras, alycour@chemistry.upatras.gr
 - o Professor Georgios Karaiskakis, KFE Director, School of Chemistry, University of Patras, g.karaiskakis@chemistry.upatras.gr
 - o Professor Nicolaos Kalogirou, PSP Director, School of Architecture, Aristotle University of Thessaloniki, salamura@tutors.eap.gr
 - o Professor Kyriakos Tamvakis, PSF Director, School of Physics, University of Ioannina, tamvakis@uoi.gr
 - o Professor Dimitris Karabalis, SMA Director, School of Civil Engineering, University of Patras, karabali@upatras.gr
 - o Professor Vasilios Kostopoulos, DIP Director, School of Mechanical and Aeronautical Engineering, University of Patras, kostopoulos@mech.upatras.gr
- Module co-ordinators from all study programs (all are members of faculty, either at School or at other universities, 38 in total, on top of the 14 directors who act as module co-ordinators as well)
- Tutors of modules (4 in total, PhD holders)
- Technical staff who act as laboratory assistants (briefly during the lab visits, 4 in total, holders of MSc or PhD)
- Students (from different years of study; undergraduate or postgraduate; also alumni, a doctoral candidate and a PhD holder; of those, 11 in Patras and 27 in Athens)
- Administrative Personnel (2)

On the afternoon of October 17 and throughout October 18, the evaluation report was compiled, taking into account additional needed documents, as these were identified,

requested, collected and evaluated.

The Committee examined the following documents:

1. The School Internal Evaluation Report (September 2012)
2. The University Studies Guide («Πρόγραμμα Σπουδών», in Greek)
3. The detailed evaluation record of all Study Programs for the 2008-12 period
4. The School's Research Publication record
5. Electronic copies of all the Study Programs presentation material
6. Samples of educational material, including textbooks, instructors' course notes, sample home works with suggested solutions, graded home works, Masters theses
7. The School and the University website
8. A document setting out the internal electronic evaluation procedures adopted by the University
9. Updated Curriculum Vitae, for all School faculty members
10. A Dossier containing written and electronic material with respect to current activities and educational and research future plans of the Physics Group and Physics Lab.
11. The approved annual budgets of the University for the Economic Years 2007-2012, as provided by the Dean of the School upon request.

Moreover, additionally, during the on-site visit, the Committee was presented with additional information pertinent to the School's operation. In particular, School staff provided information on:

- The portal that provides unified access to the:
 - o The study portal at <http://study.eap.gr> (replacing the legacy portal at <http://class.eap.gr>).
 - Read-only access to the Committee was granted to ALL thematic modules in the above portals; collections of power point (ppt) presentations, activities, code, software and virtual class playbacks are stored for all students to access.
 - o The virtual class portal at <http://centra.eap.gr>.
 - o The portal for the administration of the educational activities (meetings, grading, class members, etc.) at <http://open.eap.gr>.
 - o The Physics Laboratory own Webpage: <http://physicslab.eap.gr/>.
 - o The (under development) institutional repository (currently, at <http://edy.eap.gr>).
- The library portal at <http://lib.eap.gr>.

The Committee was provided with all relevant data and additional documentation in a timely manner. It would also like to acknowledge the quality of their internal report that provided a comprehensive overview of the School's activities up to 2012, as well as the excellent job the School did in preparing for the visit by the Committee. The Committee was impressed by the enthusiastic participation of a large number of affiliated faculty and faculty tutors in the

meetings, many of whom had to travel long distances to come to Patras.

In closing, the Committee would Like to thank the Dean and Associate Dean, Professors Hadjinicolaou and Kalles, and all University and affiliated faculty members for their eagerness to provide it with input, share their thoughts and plans about the School and for their kind hospitality.

A. Curriculum

A1. Curriculum: Undergraduate level

(Items numbering according to the contents of the University Studies Guide (in Greek).)

A1.1. Curriculum: Computer Science

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

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*

The Program Study in Computer Science is one of the two undergraduate offerings of the University's School of Science & Technology. The program's curriculum is similar in scope and nature to the standard undergraduate computer science program offered in Greek Universities. The curriculum covers a wide spectrum of foundation (i.e. PLI11, PLI12, PLI22), specialization and application course modules (courses) with particular emphasis in a) computer networks and services (i.e. PLI36), b) artificial intelligence applications (PLI31), c) programming & software engineering (i.e. PLI24, PLI40), and d) informatics & education (i.e. PLI37).

Graduates of the School should be able to a) design, implement, evaluate, and maintain software / hardware components systems, and b) play a key role in the computing and software industries in Greece. As per standing policy and current legislation, graduates of the School are recognized computing professionals entitled to work in the fields of science and technology covered by their specialty.

The undergraduate curriculum follows the international standards for an undergraduate program in Computer Science. The program offers 240 European Credit and Accumulation Transfer (ECTS) units classified under the ISCED 2011 UNESCO (computing, education). The current curriculum (2012-2013) is consistent with the stated objectives (for example, see course modules PLI37, PLI42, PLI35). The practical component of the curriculum is relatively well-matched to the society's expectations for the program.

The Committee concluded that all stakeholders (including but not limited to academic administrators, faculty members, tutors and students) were consulted prior to the establishment of the curriculum. The School of Science and Technology has in place a formal, albeit lengthy, (periodic) curriculum review and revision procedure. Though this is an

institutional process, the program study needs to ensure that it identifies the area (or areas) where the program has accumulated (or has the means to accumulate) significant expertise and focus its efforts (in terms of specialization courses, faculty, tutor and student recruiting) in this area (or areas). It is probably not realistic to expect that it will be able to compete against most established (undergraduate) computer science programs in all areas of computer science but with careful planning and targeting it will be able to successfully compete (or even better complement) by providing expertise in targeted specialization areas.

IMPLEMENTATION

- *How effectively is the School's goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*

The study program strives to provide breadth and depth across the field of study and to integrate the theory and practice as per standard policy. The overall curriculum is coherent and functional. There are three course modules per year for the first three years of study and a number of elective course modules offered during the last year of study. The work load of the current curriculum (in terms of course modules) appears to be in-line with the course load seen in typical undergraduate computer science programs. The course material is structurally coordinated, in the sense that the subsequent courses build on previously taught concepts. The Committee's review of the pertinent course syllabus and material indicates that there is limited, albeit within normal practice, course module material overlap.

Due to the nature of the program deliverance in the Hellenic Open University a large number of stipend instructors (tutors) are currently hired yearly to support the needs of the program (course module offerings). This introduces considerable administrative overhead for the course module directors and it may potentially impact the quality of the program (i.e. lack of coherence in mode of deliverance). The program study understands the issue and it has taken steps in addressing it. "Best practice" guidelines have been established and "quality control procedures" (i.e. continuous evaluation by students, course module and program directors) are in place.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*

Since its inception the program study in computer science remains in high demand, suggesting that the implementation of the curriculum has managed to achieve the stated goals and objectives. The latest numbers (at the time of the evaluation) indicated that approximately 35% of the incoming class drop out of the program prior to completing the first course module. This however is to be expected due to the nature of the program and the admission process followed by the University. The Committee noted with satisfaction a steady improvement on the percentage of students graduating from the program. For example the number of students graduating in 2012 was 143 up from 122 during the 2008 academic year. The average time from admission to graduation remains constant to about 6.5 years. This is to be expected for a four year undergraduate degree and it is inline with the numbers reported by peer institutes (Open Universities) for their programs.

The Committee noted with satisfaction that the students appear to value the curriculum and the faculty's efforts. Student evaluation reports and summary numbers supplied by the School indicate that the students think highly of the program. Students evaluated, on average, the various course modules with 4.2/5 (consistently of the highest scores amongst the School's programs). It should be noted that the programs peer review evaluation average tracks exceptionally well the student evaluation (peer review evaluation 4.3/5).

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

The program study recognizes the difficulties that some students have in following through the curriculum. It understands the realities that are at place in regards to the background and diversity of its student population. It should think about ways to address the insufficient background that some students may have in mathematics, physics, and computer skills (i.e. by offering to the students, at no cost, a preparatory course module and by allowing good students to opt out by simply taking its final examination).

Due to its nature of program deliverance at the University the program study relies on web-page course management software. The students use the system extensively. Members of the

faculty and students alike make extensive use of course module wide wiki-style collaborative tools, blogs and student forums. The committee recognizes the program study's efforts to constantly enhance the quality of the program through the introduction of new and advanced collaboration tools, such as virtual class meetings, immersive 3D environments, anonymous polling, and LAMS-based activities. The Committee also acknowledges the program's efforts to streamline its content delivery operations in order to enhance student experience. Posting lecture notes on-line, posting solved examples and self-learning practice examinations, web-casting tutor-student face-to-face meetings (OSS), accepting and returning graded material online (i.e. moodle.eap.gr), and setting centrally enforced homework deadlines across modules and sections are all steps towards the right direction when it comes to enhancing the student experience.

The Committee feels that institutional changes are called for in order to support an already improving situation with respect to improving the practical component of the curriculum (i.e. laboratory sessions). In particular the Committee is delighted to note the proposed re-activation of existing laboratories and the establishment of new undergraduate/teaching laboratories (i.e. human computer interaction).

The current collaboration with peer programs, within as well as outside the School of Science & Technology should be strengthened and encouraged. The current practice of offering mini project thesis within PLI40 (course module on "Project Software") is an excellent idea. The proposed introduction of a "diploma thesis" option in all areas of the program is a step towards the right direction. A diploma thesis in fourth year will provide students with the opportunity to work on projects representative of assignments encountered in industry.

A1.2. Curriculum: Studies in Natural Sciences

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*
-

The program "Studies in Natural Sciences-FYE" («Σπουδές στις Φυσικές Επιστήμες – ΦΥΕ»)

is one of the two undergraduate programs of the School of Science & Technology. The undergraduate FYE curriculum is based on 4 years of study. The Bologna Process has been implemented and the entire program corresponds to 240 ECTS credit units. The program aims to provide students with an introduction to the fields of Physics, Chemistry and Biology. It also offers the opportunity to students to understand key principles, concepts, established theories and main applications, as well as develop their problem solving skills.

The program consists of a total of 12 course modules (3 course modules per year), including laboratory courses in Physics, Chemistry and Biology.

More specifically, the undergraduate curriculum consists of a combination of introductory courses, main courses and elective courses according to the following scheme:

- 4 mandatory introductory course modules: in Natural Sciences (FYE14), in General and Inorganic Chemistry (FYE12), and in Mathematics (FYE10, FYE22), respectively.
- 7 mandatory main course modules: in Physics (FYE24, FYE34, FYE40), in Physical Chemistry and Organic Chemistry (FYE22, FYE30), and in Cell Biology and Genetics (FYE31, FYE43), respectively.
- 1 elective course module from the following list:
 Evolution of Ideas in Natural Sciences (FYE41),
 Planet Earth (FYE42),
 Didactic of Natural Sciences (EKP63),
 Introduction to Computer Science (PLI10).

Also, two laboratory exercise courses for each discipline (Physics, Chemistry, and Biology) are adapted to the mandatory course modules.

IMPLEMENTATION

- *How effectively is the School's goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*

The initial program objective is to introduce students to the broad field of natural sciences; i.e., in Physics, in Chemistry, and in Biology and to make them familiar with recent developments and achievements in these topics. Students also acquire skills in mathematical modeling and problem solving.

It also offers the opportunity to interested graduate students to continue in postgraduate and doctoral studies in the fields of science.

Given the limitations in deepening that an interdisciplinary program has, the Committee considers that the course modules offered cover to a great extent (~75%) to what is expected for a pure Physics program and less <50% and <30%, for Chemistry and Biology, respectively.

The teaching laboratories are well equipped and cover the basic needs of an undergraduate program in these areas. However, the Committee feels that the execution of the experiments during a short time period (two weeks in the summer) is pedagogically not adequate since this does not allow the students to understand and consolidate the exercises material.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

The overall structure of the undergraduate curriculum is well within the scope initially set for this kind of interdisciplinary program. However, there is rather little international experience concerning this program type to compare with.

The Committee highly appreciates the examination practice, also applicable to all school's programs, that students are being continuously evaluated; i.e. periodic assessments through "class" assignments and home works or, in some cases, through a separate exam for each module sub-subject (FYE, MSM, etc.), and not only through a single examination at the end of the course.

The Committee also here noted with satisfaction that students evaluate the curriculum very positively and highly appreciate the faculty's efforts. For instance, according to student's evaluation reports and summary numbers supplied by the School, they evaluate the teaching capabilities of the academic personnel involved and the organization of the subject items of the program with the high scores of 4.35/5 and 4.11/5, respectively.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

The Committee would like to stress the importance of introducing a final-year project in the fourth year of study (Diploma Thesis) that has to be mandatory and to last a full year. This helps students to develop and enhance their own initiatives and introduces them to research and/or to a professional career.

The Committee further believes that a major priority should be taken in the recruitment of specialized technical personnel, together with a solution of providing stipends/fellowships to postgraduate students through teaching assistantships in order to help run and improve the experimental setups.

During its visit to the University the Committee became aware that there are discussions and plans within the faculty to restructure/extend the FYE curriculum, so that more applied topics in education and technology are included. The Committee strongly supports this step, which is certainly consistent with the international experience and particularly with the needs of the students to acquire expertise in more applied topics in the educational process and in modern technologies. In this way, they will develop and improve their skills considerably, thus opening up better opportunities in their professional career.

The Committee would also encourage the School to think about the incorporation of Chemistry and Biology into a separate undergraduate curriculum in the future, with emphasis i.e. in Biochemistry and Molecular Biology. Towards to this end, the Committee suggests to start this new program on the postgraduate level first.

A. Curriculum

A2. Curriculum: Postgraduate level

(Items numbering according to the contents of the University Studies Guide (in Greek.))

A2.1. Curriculum – Environmental Design of Cities and Buildings

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

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*

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

The Masters Program titled “Environmental Design of Cities and Buildings-PSP” («Περιβαλλοντικός Σχεδιασμός Πόλεων και Κτιρίων – ΠΣΠ») aims to provide participants with the necessary knowledge and tools for designing and managing cities and buildings in an environmentally appropriate manner.

To achieve these objectives the curriculum offers an introductory course module (PSP 50) regarding the natural and human environment, followed by advanced design course modules (PSP 51, 60 and 61) that cover sustainable design principles across different spatial scales; regional, city, neighborhood and building.

Eligibility for this Program is restricted to graduates of Greek Universities and Technical Education Institutes in related fields (e.g. architecture, civil engineering, rural and surveying engineering, regional planning, etc.).

The course module offerings provide the necessary background in urban and regional planning and evaluation and assessment methods of environmental consequences, understanding of building methods and materials, human and cultural factors and their influence on architectural solutions, climate shifts and their impact on building materials and bioclimatic design of buildings and their surrounding open air spaces.

The Masters Thesis offers students the opportunity to work on and develop their own environmentally friendly designs for cities, neighborhoods, open spaces and buildings. The Committee evaluated this feature very positively and would strongly encourage Thesis supervisors to adopt it as standard practice.

This is a popular Masters Program with a unique focus, not covered by graduate programs in any other Greek University. Although the breadth of topics is large, the Committee felt that the coverage is appropriate. It was designed by the original Program Study Directors and course module instructors and the syllabus has been enhanced over the years by incorporating feedback provided by the students and tutor faculty.

The current Program Study Director presented the Committee with a plan to revise the curriculum, by streamlining and updating the content of most course modules, revising and updating the main books, changing the focus of the Master Thesis from a primarily literature review one to an “experimental”/case study one.

IMPLEMENTATION

- *How effectively is the School’s goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*

- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

Overall, the program is well structured, extremely popular and of high quality. The Committee felt that the course module offerings are functional, cover the necessary concepts and tools in sufficient depth and breadth and are in general compatible with similar international programs. Due to the nature of the instruction at the University, the course modules are supervised by a large number of faculty tutors. Nevertheless, the Committee believes that the quality of the instruction is uniform across sections offered.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

This Masters program seems to have reached a steady state, with approximately 95-105 new students enrolled each year, over the 2006-12 time period. This rather high demand suggests that the implementation of the curriculum has managed to achieve the School's predefined overarching goals and objectives. Due to developments in the field the teaching faculty has incorporated a lot of additional material, offered through the Web portal of the University. Nevertheless, a revision of the core material contained in the main book accompanying each course module is deemed necessary.

The Masters Theses submitted are in general innovative and of high quality. It would be beneficial to the students if all of them incorporated a novel design aspect and were presented at a symposium open to city and regional planners.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

The School is aware of the need to update the contents of the main book accompanying the course modules. However, such a revision is subject to numerous bureaucratic hurdles, not necessarily under the School's control.

The immediately feasible solution is for the teaching faculty to continue their efforts to

improve the supplementary material offered electronically (that in addition improves its quality, e.g. high resolution colored designs and maps). Further, all Master Theses should contain aspects of novel designs.

Finally, the Program in coordination with the School should “advertise” to diverse stakeholders (city and regional planners, mayors, etc.) the results and achievements of the Master Theses submitted by students.

A2.2 Curriculum – Environmental Design of Infrastructure Works

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*

The Masters Program in “Environmental Design of Infrastructure Works-PSE” («Περιβαλλοντικός Σχεδιασμός Έργων Υποδομής – ΠΣΕ») aims to equip its participants with a deeper understanding of the environmental impact of and appropriate design, control and management strategies for infrastructure works.

To achieve these objectives the curriculum offers an introductory course module (PSE 50, shared with the PSP Program) regarding the natural and human environment. It is followed by a course module on design, environmental consequences and assessment methods (PSE 51) and advanced modules on design of infrastructure works (PSE 60) and technologies for mitigating environmental impact (PSE 61).

Eligibility for this Program is restricted to graduates of Greek Universities and Technical Education Institutes in broadly defined related fields.

The course module offerings provide the background in a broad spectrum of areas. According to the presentation to the Committee by the Program Study Director Professor Zervas, the curriculum suffers from overlaps between course modules (e.g. PSE 60 and 61), and occasional lack of focus. Hence, the students experience difficulties in mastering the contents

of these course modules leading to subpar performances at exam time, while the faculty tutors face similar difficulties in presenting and explaining such heterogeneous material. Another piece of evidence comes from the very low scores (around 2 on a 5 point scale) that the main books in PSE 60 and 61 get.

The Masters Thesis usually focuses on providing a careful literature review of infrastructure projects and their environmental design and management. Occasionally, a more research oriented topic that has the potential to produce novel results is addressed.

Program Study Director Professor Zervas presented the Committee with a plan to revise the curriculum, by streamlining and updating the content of most course modules, revising and updating the main books, changing the focus of the Master Thesis from a primarily literature review one to an “experimental”/case study one.

IMPLEMENTATION

- *How effectively is the School’s goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

The curriculum of this Study Program is functional, although as mentioned above its structure could be further streamlined and hence increase its coherence. Although the course modules are functional and cover the necessary concepts and tools, their overlap and occasional poor focus is a concern that requires the Program’s attention.

RESULTS

- *How well is the implementation achieving the School’s predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

This Masters program seems to have reached a steady state, with approximately 90-100 new students enrolled each year, over the 2006-12 time period.

This suggests that the implementation of the curriculum has managed to achieve the School’s objectives.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

The Study Program Coordinator has developed a plan to revise and streamline the curriculum. The Committee believes that close coordination between the Program Coordinator, the faculty tutors and the School is necessary to successfully achieve this revision in the near future.

A2.3 Curriculum – Quality Assurance**APPROACH**

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*
-

The Masters Program titled “Quality Assurance - DIP” («Διασφάλιση Ποιότητας – ΔΙΠ») aims to provide participants with integrated training in quality control technologies and management. To achieve these objectives the curriculum offers introductory (DIP 50 and 51) and advanced (DIP 60 and 61) course modules, capped with a Masters Thesis. Due to the diverse nature of the student body the program also offers an undergraduate level overview course module (DIP 40) to ensure that all participants have the necessary background for the required curriculum. This module is mandatory for graduates of Technical Educational Institutes and optional for University ones.

The course module offerings provide the necessary breadth and depth in statistical methods and other tools for quality control and improvement, together with the study of quality systems and management principles. The Masters Thesis broadly offers the students the opportunity to either provide a review of available in the literature technical and management methods related to quality assurance and managements, or implement specific methods learned to a practical problem of interest to the student (case study).

The Masters in Quality Assurance is a popular program with students of diverse backgrounds. Hence, the structure of the curriculum is appropriate in providing the necessary background and training to all participants. It was designed by the original Program Study Directors and course module instructors and the syllabus has been enhanced over the years by incorporating feedback provided by the students and tutor faculty.

The current Program Study Director presented the Committee with a plan to revise the curriculum that needs to follow the (lengthy and bureaucratic) necessary revision procedures of the University.

IMPLEMENTATION

- *How effectively is the School's goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

Overall, the program is well structured, extremely popular and of high quality. The Committee felt that the course module offerings are functional, cover the necessary concepts and tools in sufficient depth and breadth and are in general compatible with similar international programs. Due to the nature of the instruction at the University, the course modules are supervised by a large number of faculty tutors. Nevertheless, the Committee believes that the quality of the instruction is uniform across sections offered.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

The Masters program has been successful in graduating a total of 455 students for the 2006-2012 time period. This high demand suggests that the implementation of the curriculum has managed to achieve the School's predefined overarching goals and objectives. However, there is room for improvement regarding the Master Thesis component of the program, as discussed next.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

Despite the popularity of this program and its overall importance to the Greek Economy, it has been and continues to be directed by associated faculty members. The Committee acknowledges the excellent service that these members have rendered to the program, but strongly believes that the addition of a core University faculty would be beneficial.

Another area of improvement relates to the Masters Thesis projects. As the new Program Director, Professor Kostopoulos, mentioned in his presentation, the quality of the Thesis exhibits substantial variability. This is a concern that should be immediately addressed.

A2.4. Curriculum – Earthquake Engineering and Seismic Resistant Structures

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*
-

The scope of the program is to provide specialized studies and knowledge to Civil Engineers in the area of Earthquake Engineering and Seismic-Resistant Structures, which will contribute to the elevation of the technical potential of the country educationally and professionally. The course provides the necessary theoretical background in seismology and soil and structural dynamics and emphasizes seismic design and repair and strengthening of building structures made of reinforced concrete, steel or other materials.

The curriculum is consistent with the objectives of the course and addresses problems directly relevant to technical aspects of ground dynamics and technical seismology (SMA51). A component of practical importance is the dynamic analysis of structures (SMA50) and the design of anti-seismic structures (SMA60). A description of seismic damage and repairs and

structural support (SMA61) complete the course offerings. The course is of great importance considering the earthquake prone nature of Greece.

IMPLEMENTATION

- *How effectively is the School's goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

The School's goal is effectively implemented by this curriculum which compares well with universally accepted standards. The curriculum is standard, well-articulated, coherent, and appears functional. The material for each course is appropriate and implemented by well qualified staff.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

The Schools predefined goals are well implemented.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

The curriculum can be improved by the introduction of additional aspects of seismic science concerning plate dynamics and the effects as a function of geography and time but it must await the addition of new faculty staff.

A2.5 Curriculum – Engineering Project Management

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*
-

The course aims to train professional engineers to move into higher management positions within the construction services industry.

To achieve the goals of the curriculum, an impressive number of specific aspects of business administration, management and engineering construction are utilized. Specifically, Unit DCHT50 is a general introduction to business administration, construction site organization and management. This unit is followed by DCHT51 which deals with the analysis and design of structures, principles of construction technologies and building materials and construction equipment. The last two units (DCHT60, DCHT61) cover construction law, safety, environmental aspects, engineering economics construction planning scheduling and control. This is a really impressive approach which is consistent with the objectives of the curriculum. It does not appear that a revision will be necessary.

IMPLEMENTATION

- *How effectively is the School's goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

The School's goal is very well implemented by the curriculum and compares very favorably with the expected universally accepted standards.

As presented, the structure of the curriculum is rational, coherent and functional. The

material for each course is appropriate and subject to minor corrections in the available texts sufficient.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

The School's predetermined goals and objectives should be very well implemented.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

As it now stands, the curriculum does not need an improvement. The depth and volume of the material may need an increase in the number of instructors.

A2.6. Curriculum – Information Systems

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*
-

The program aims to: a) offer its students the opportunity to acquire specialized knowledge in information and communication (ICT) technologies, and b) prepare them for professional work in the design, development, evaluation, and management of integrated information systems. The program targets science and technology graduates and covers the design and

development of programs and systems, the management and the quality of system development, and advanced issues in information systems design.

The program offers 120 European Credit and Accumulation Transfer (ECTS) units classified under the ISCED 2011 UNESCO (computing, education). The current curriculum (2012-2013) is consistent with the stated objectives (for example, see course modules PLS60, PLS61, PLS62) and provides the necessary educational background needed within the field of study.

Students are required to successfully complete at least four (4) course modules and to submit and defend a graduate thesis (Masters thesis, 20 ECTS units). The Masters thesis offers students the opportunity to a) provide a literature review (critique) of the prior-art in a chosen topic within the program's field of study, b) implement specific methods learned to a practical problem of interest to the student (case study), or c) the opportunity to work on projects representative of assignments encountered in industry.

The Committee concluded that all stakeholders, including students, were consulted prior to the establishment of the curriculum. PLS is a popular program. Feedback provided by the students and input provided by tutors has been used to update course content and enhance student experience.

IMPLEMENTATION

- *How effectively is the School's goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

The program strives to provide breadth and depth across the field of study and to integrate the theory and practice as per stated goal. The currently implemented curriculum is deemed by the Committee to be of high quality. The offered course modules provide the necessary background and it is comparable to programs offered internationally. The curriculum is well balanced. The Committee's review of the pertinent course syllabus and material indicates that there is minimum course module material overlap and that the quality of the per course module instruction is uniform across the various sections.

RESULTS

- *How well is the implementation achieving the School's predefined goals and*

objectives?

- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*

The graduate program is in high demand suggesting that the implementation of the curriculum has managed to achieve the stated goals and objectives. The curriculum's implementation is well-matched to the students' expectations for the program (in terms of preparing ICT specialists). The Committee noted a steady improvement on the percentage of students graduating from the program. For example the number of students graduating in 2012 was 67 up from 34 during the 2008 academic year. The average time from admission to graduation increased modestly from 3.7 to 4.3 years. This is to be expected for a part time graduate program with a nominal completion term of three years. Review of the pertinent documentation indicates that the students value the curriculum. It should be noted that the average student evaluation for the program content is 4.2/5 slightly higher than the peer review evaluation average of 4.1/5.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

The program understands the need to enrich the quality of graduate academic experience by developing opportunities for students to pursue their professional and research interests.

There is a need for the program to connect with local industry, government Schools and non-for profit organizations. It should allow students to bring their professional expertise into the curriculum (for example by selecting a thesis topic of interest to them) and promote knowledge sharing.

The program should encourage students to a) work with industries and companies, b) participate in Working Groups and Task Forces, c) engage with others so that to bring their expertise and perspective to policy, industry standards and to government.

A2.7. Curriculum – Teaching Natural Sciences

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*
-

The program “Teaching Natural Sciences –KFE” («Εξειδίκευση Καθηγητών των Φυσικών Επιστημών- ΚΦΕ») is designed to offer scientific knowledge, together with technical and methodological skills to Secondary Science Teachers. Upon its completion, graduates will:

- a) have a more scientific approach to teaching Physics, Chemistry and Biology
- b) be able to understand and convey to students, through educational processes, classical and modern theories of Natural Sciences and their role within the unified scientific world
- c) have acquired requisite skills and scientific competence for using experiments to investigate and prove scientific theories and hypotheses
- d) have acquired special methodological training to design and carry out educational projects at school or within the wider educational community, or local community
- e) will have required level of competence to use information technology to design and produce electronic learning material.

The program offers 120 European Credit and Accumulation Transfer (ECTS) units. The current curriculum (2012-2013) is consistent with the above-stated objectives and provides the necessary educational background needed within the field of study.

Students are required to successfully complete at least four (4) course modules, out of 5 offering course modules (from KFE51-53 to KFE60,61), and to submit and defend a graduate thesis (Masters thesis, 40 ECTS units). The Masters thesis offers students the opportunity to:

- a) provide a literature review in a chosen topic within the program’s field of study,
- b) implement specific methods learned to a practical problem of interest to the student (case study), or c) opening up the opportunity to work with groups carrying out research projects.

IMPLEMENTATION

- *How effectively is the School’s goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards*

for the specific area of study?

- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*

The Committee notes that the currently implemented curriculum is of very good quality. The offered course modules provide the necessary scientific approach for teaching Physics, Chemistry, and Biology in the secondary education. Alternatively, it offers the opportunity to interested graduate students to continue with doctoral studies. Although it is difficult to compare this program with other postgraduate programs, the Committee is positively impressed by the rather high number of students attended on a constant basis over the 2006-2012 time period (90-120 new enrolments per each year).

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

The Study Program in its current composition has managed to achieve the stated goals and objectives. Specifically, it meets to a large extent the initial targets set and provides its students with:

- a) The global expertise of Teachers of Natural Sciences and reliable knowledge searching in the broad field of the Natural-Sciences disciplines.
- b) Their teaching improvement through more effective transfer of scientific knowledge in the educational process, and
- c) acquire familiarity with the use of new technologies.

The Committee noted also that the scores of the student's evaluation of the teaching and the organization of the subject areas of the program are rather moderate (3.84/5 and 3.65/5, respectively).

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

The Director of the Study Program presented a plan to address the issue of teaching approach, which in the current program structure is achieved mainly in the context of the

diploma thesis, and also in the course module KFE60.

The Committee strongly supports this step and underlines that the addition of focused and carefully written teaching aids will be a big step forward towards this goal, as initialized in the course module KFE52.

Also, the planned introduction for the current academic year of stronger ties between homework assignments and final exams will be beneficial to the students.

Beyond these improvements, the Committee further suggests that the program be enriched to cover recent developments in the Natural Sciences, both in theoretical and applied directions.

A2.8. Curriculum – Postgraduate Studies in Mathematics

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*

The Program “Postgraduate Studies in Mathematics” («Μεταπτυχιακές Σπουδές στα Μαθηματικά– ΜΣΜ») aims to equip its participants with a deeper understanding of fundamental mathematical concepts, enhance their modeling and computational skills and finally better prepare them for a teaching career in secondary education units. It also offers the opportunity to a graduate student to continue his studies on a PhD level, by carrying out research projects in theoretical and applied mathematics.

To achieve these objectives the curriculum offers three mandatory courses, (MSM50, MSM60 and MSM61) and two elective courses, (MSM51 and MSM62). The course module MSM50 reviews fundamental concepts in mathematical analysis, linear algebra, stochastics and geometry, while the module MSM60 addresses issues on mathematical modeling tools for the sciences (e.g. partial differential equations, topics in functional analysis and linear

algebra and integral operators). Advanced courses cover topics in computational mathematics (MSM51), history of mathematics and mathematical education (MSM61) and special topics (MSM62), respectively.

Eligibility for this Program is restricted to graduates of Greek Universities and Technical Education Institutes in mathematics.

The course module offerings provide the necessary background in key areas of pure mathematics, such as analysis, algebra and geometry, together with tools in applied (differential equations) and computational mathematics. They also cover historical aspects useful for educational purposes. On the other hand, the special topics module focuses on selected mathematical models used in the physical and biological sciences, but this focus may be too narrow.

The Masters Thesis usually focuses on providing a careful literature review of a mathematical problem and its solution, or traces its historical evolution. Occasionally, a more research oriented topic that has the potential to produce novel results is addressed. Given the nature of the scholarship in mathematics, this strategy is perfectly justified.

The current structure of the curriculum is geared towards teachers in secondary education and the current course offerings do not cover topics of interest to a broader audience (e.g. optimization, stochastic modeling in the biosciences and informatics, applied operations research, etc.). The Committee felt that a carefully targeted broadening of the curriculum would significantly enhance the attractiveness of the Program and could also lead to synergies with other Programs offered by the School (e.g. Computer Science).

The current Program Study Director presented the Committee with a plan to revise the curriculum and introduce new elective course modules with a strong emphasis on stochastics and biological problems. This is a welcome development that should be pursued by the Program and the School as soon as possible.

IMPLEMENTATION

- *How effectively is the School's goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

Overall, this Study Program is rigorously structured, and of high quality, albeit fairly narrow in its scope. The course module offerings are functional, cover the necessary concepts and tools in sufficient depth and breadth and are in general compatible with similar international

programs.

As mentioned above, the content of the special topics module (MSM62) is rather narrow.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

The Masters program has been successful in graduating a total of 80 students for the last 5 years, while the number of applicants has held steady over this time period.

This suggests that the implementation of the curriculum has managed to achieve the School's predefined overarching goals and objectives. Nevertheless, a careful expansion of the curriculum would increase the appeal of the program beyond secondary education teachers to professionals working in diverse fields, both in the public and private sector. Such a development would be beneficial both to the School, the University and ultimately the Greek economy.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

The School is aware of the need for expanding the course offerings. The plan presented by the Program Coordinator is coherent and should be implemented as soon as possible, since it would increase the overall appeal of the Program.

A2.9. Curriculum – Advanced Studies in Physics

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*

- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*
-

The program “Advanced Studies in Physics – PSF” («Προχωρημένες Σπουδές στη Φυσική-ΠΣΦ») aims to provide advanced knowledge to graduate students with scientific background in the fields of Natural Sciences. The program is mainly oriented on the knowledge of the physicochemical properties of solid materials and solid surfaces as well as those in related scientific fields.

The program offers 120 European Credit and Accumulation Transfer (ECTS) units. The current curriculum (2012-2013) is consistent with the objectives set and provides a rather broad and advanced scientific background needed within the field of study.

Students are required to successfully complete at least four (4) course modules, out of 5 offering course modules (PSF50, PSF51, PSF60, PSF61, PSF62), and to submit and defend a graduate thesis (Masters thesis, 40 ECTS units). The Masters thesis offers students the opportunity to a) provide a literature review in a chosen topic within the program’s field of study, b) implement specific methods learned to a practical problem of interest to the student (case study), or c) the opportunity to work with groups carrying out research projects.

IMPLEMENTATION

- *How effectively is the School’s goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

The Committee finds that the currently implemented curriculum is of high quality. The program is well structured and fulfills the objectives set. It provides the appropriate graduate student with the scientific background, so that the graduate has the possibility of a general supervision of the research front in Physics. Furthermore, students can acquire, through the master thesis, familiarity with research methodology. It is up to each graduate, whether he will continue his studies within the framework of a doctoral thesis.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

The graduate program in its current composition has managed to achieve the stated goals and objectives. More specifically, it meets to a great extent the international standards and provides the graduate students with:

- a) Specialization in classical and modern topics in physics.
- b) The general background required for dealing with most issues of contemporary research in physics forehead, and through the master thesis,
- c) acquire familiarity with recent developments in related research areas.
- d) The necessary scientific background to be able to subsequently pursue with a doctoral degree.

The Committee noted with satisfaction the rather high scores of the student's evaluation of the teaching and the organization of the subject areas of the program, of 4.11/5 and 4.17/5, respectively.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

Although the program curriculum is well structured and consistent with international experience, the Committee strongly suggests that it can be further improved by incorporating additional topics from the broad fields of physics applications; i.e. radiation-physics and medical-physics applications, medical imaging, as well as new technologies in renewable energy sources, etc. This could be achieved, for instance, by introducing another course module in the sense of that of the PSF62 course. Most importantly, the Committee strongly believes that the program can be substantially enriched by the introduction of additional mandatory advanced-laboratory course modules, also covering the applications areas mentioning above.

It is clear that such program improvements and extensions will enable the interesting graduate students to find a link with the private sector and the local industry; an important issue that is highly required for future real economic prospects and better employment possibilities of young scientists.

A2.10. Curriculum – Catalysis and Environmental Protection

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*
-

The main goal of the program is the detailed study of the catalytic science and technology and their applications in producing clean energy and in the environmental protection. The graduates are expected to be able to contribute to the development of novel catalysts and catalytic processes (or to the improvement of existing ones) related to the catalytic destruction of pollutants and to the production of environmentally friendly fuels.

A nearly complete set of subjects relative to catalysis are included in this curriculum.

These include: a) Introduction and Terminology (a short description of catalysis, homogenous and heterogeneous catalysis, catalysis and chemical equilibria, catalytic cycle, catalytic activity, selectivity and stability, the general mechanism of catalytic action).

b) Homogeneous and Enzyme Catalysis (the catalytic action of the transition metal ions and the catalytic action of transition metal complexes, either free or supported on various supports.

c) Catalysis at the interface of two liquids and catalysis by clusters.

d) Enzyme catalysis,

e) Heterogeneous Catalysis ,

f) Heterogeneous acid-base catalysis: zeolites (development of acid-base surface sites on solid oxides e.g. MgO, γ -Al₂O₃, SiO₂, γ -Al₂O₃-SiO₂) the structure and surface properties of zeolites, the catalytic action of zeolites.

g) Introduction to the Surface science (surfaces and solid-solid interfaces, bulk structure and surface structure of a solid,

h) catalyses on clean surfaces at atomic level and very high vacuum).

IMPLEMENTATION

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

- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

The approach is very effective and compares with those of universally accepted standards. The structure of the curriculum is standard and clearly articulated. The material for each course is appropriate. The staff is certainly well qualified and trained.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

The implementation is expected to achieve the predefined goals.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

No improvements are necessary at present, for this well-conceived curriculum.

A2.11. Curriculum – Waste Management

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including*

students and other stakeholders, consulted?

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

The aims of this Study Program are to provide specialized knowledge on waste management techniques and purification processes and to develop understanding of the complex environmental systems, which are affected by waste disposal.

The four course modules consist of a general module that addresses pollution of the general environment and continues with three modules that deal with pollution by solid wastes, liquid wastes and gaseous wastes. The approach is a standard one used by concerns in environmental protection. The curriculum is consistent with the requirements of society and was decided by the mutual consent of the faculty involved. The curriculum is flexible and subject to revisions as necessary.

IMPLEMENTATION

- *How effectively is the School's goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

The School's goal is well implemented by the curriculum and the latter compares well with universally accepted standards. The structure and rational are clearly articulated and the curriculum is coherent and functional. The material for each course is appropriate and the time offered sufficient. It is not clear to what extent the very important topic dealing with pollution of the sea-water is considered.

The School has the necessary resources and personnel to implement the curriculum.

RESULTS

- *How well is the implementation achieving the School's predefined goals and objectives?*
- *If not, why is it so? How is this problem dealt with?*
- *Does the School understand why and how it achieved or failed to achieve these results?*
-

The implementation of the curriculum achieves most of the predefined goals although the

subject of pollution is very broad and difficult to address.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

The School is aware of how the Curriculum should be improved. Unfortunately the magnitude of the subject matter demands additional teaching members that presently are not available. The contributions of the School nevertheless should be applauded. The country depends greatly on tourism and natural resources that attract tourists. A strict control of pollution will maintain the desired quality of the natural resources.

A2.12. Curriculum – Engineering of Pervasive Computing Systems

APPROACH

- *What are the goals and objectives of the Curriculum? What is the plan for achieving them?*
- *How were the objectives decided? Which factors were taken into account? Were they set against appropriate standards? Did the unit consult other stakeholders?*
- *Is the curriculum consistent with the objectives of the Curriculum and the requirements of the society?*
- *How was the curriculum decided? Were all constituents of the School, including students and other stakeholders, consulted?*
- *Has the unit set a procedure for the revision of the curriculum?*
-

The graduate program in engineering of pervasive computing systems (SDY) offers students the opportunity concepts, technologies and skills pertinent to the design, development and use of pervasive and mobile computing systems. Targeting professionals with expertise in computer science and telecommunications specialists the program offers an opportunity to a) acquire the skills need for the design of mobile and pervasive computing systems, b) study and evaluate pervasive solutions, and c) analyze their quality and performance requirements.

The program offers 120 European Credit and Accumulation Transfer (ECTS) units classified under the ISCED 2011 UNESCO (computing, education). The current curriculum (2012-2013) is consistent with the stated objectives (for example SDY60 and SDY61) and provides the necessary educational background needed within the field of study.

Students are required to successfully complete at least four (4) course modules and to submit and defend a graduate thesis (Masters thesis, 24 ECTS units). It should be noted that this is a recent addition to the graduate offerings of the School of Science and Technology. The program started during the 2010-2013 academic year with a (nominal) length of study of three years.

Based on the submitted documentation and the interviews during the site visit the Committee concluded that all stakeholders, including students in both the undergraduate and graduate studies in computer and information science, were consulted prior to the launch of the program. It appears that the program's curriculum is up-to-date and there are no plans for revising it. As of 2013, students enrolled in the program are required to enroll in one of the two course modules offered during the first year of study, namely SDY50 or SDY51. Course module SDY60 is mandatory and students are allowed to enroll either in course module SDY61 (thus specializing in mobile computing) or SDY62 (area of specialization: embedded systems).

IMPLEMENTATION

- *How effectively is the School's goal implemented by the curriculum?*
- *How does the curriculum compare with appropriate, universally accepted standards for the specific area of study?*
- *Is the structure of the curriculum rational and clearly articulated?*
- *Is the curriculum coherent and functional?*
- *Is the material for each course appropriate and the time offered sufficient?*
- *Does the School have the necessary resources and appropriately qualified and trained staff to implement the curriculum?*
-

The program attempts to cover background need in its field of study and to integrate the theory and practice as per stated goal. The program appears to have been based on best practices in the United Kingdom and Ireland (i.e. MSc Mobile and Ubiquitous Computing-Trinity College Dublin, MSc in Mobile and Ubiquitous Computing – Lancaster University, Mobile & Ubiquitous Systems MSc - University of Glasgow). The currently implemented curriculum is deemed by the Committee to be adequate. The offered course modules provide the necessary background. The two areas of specialization (mobile systems vs. embedded systems) are often encountered in similar programs offered internationally. The Committee's review of the pertinent course syllabus and material indicates that there is minimum course module material overlap and that the quality of the per course module instruction is uniform across the various sections.

RESULTS

- How well is the implementation achieving the School's predefined goals and objectives?
- If not, why is it so? How is this problem dealt with?
- Does the School understand why and how it achieved or failed to achieve these results?
-

The program appears to be in demand with 108 registered students during 2012 up from 64 students during the 2011 academic year. However due to the short review cycle (program launched in 2010) Committee recommends that the School of Science and Technology monitors the program deliverance to ensure the curriculum implementation matches the stated program objectives.

The Committee wants to acknowledge the efforts made by the School to enhance the student experience. The planned addition of four "smart" lecture rooms, the introduction of new course modules, the extensive use of virtual tutor-student meetings, and the provision for the establishment of new labs, as outlined in the program director's presentation, will be well received and contribute to the program's popularity and longevity.

IMPROVEMENT

- *Does the School know how the Curriculum should be improved?*
- *Which improvements does the School plan to introduce?*
-

As it was previously stated the curriculum is based on best practices followed in the British Isles. The program understands the needs to take a careful look at its curriculum without trying to compare it or match it with curriculums at similar (open universities) or in equivalent institutes in Greece and abroad.

Given the nature of the field of study and the focus of the curriculum the program should seek-out and deepen the collaboration with a) sister programs within the School of Science and Technology (i.e. Information Systems), b) other University programs (i.e. Multimedia Systems, Management programs, Tourism Business Management), and c) international partners (the collaboration with Vrije Universiteit Brussel is a step in the right direction).

B. Teaching

APPROACH:

Does the School 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*
- *Use of information technologies*
- *Examination system*
-

Due to the special nature of the University, teaching is based on the concept of self-paced learning. Specifically, students are provided with the necessary learning material (textbook, course notes, audio and video supplements, software, etc.) and they are expected to plan and allocate their personal course material review time, as well as work on course activities (e.g. quizzes, homework assignments). Moreover, students are provided with a study guide that assists them on how to devise a study plan for each course module.

The learning process is continuously supported by the assigned faculty staff. Specifically, students are divided into sections (not exceeding 30 students) headed by a faculty tutor who represents their main contact/advisor for a particular course module throughout the academic year. Students participate in at least 5 live official contact sessions during the 10-month course duration. In addition, further contact between tutors and students is accomplished through e-mail, phone calls and, lately, video-conferencing. Although the official contact sessions are not mandatory, they are strongly recommended and according to student feedback the vast majority of students attends them and finds them extremely useful. In fact, many students during the interview with the Committee asked for additional contact sessions.

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?*
- *Linking of research with teaching*
- *Mobility of academic staff and students*
- *Evaluation by the students of (a) the teaching and (b) the course content and study material/resources*
-

Module courses require 4-6 written homework assignments and are evaluated by the faculty tutor who provides detailed written comments and encouragement. The Committee examined numerous such assignments and was impressed by the detailed and high quality feedback provided by the tutors to the students.

The final course module evaluation is accomplished by a written in class examination at the end of the academic year.

The Committee also examined Masters theses, whose content varies between study programs. Some theses are more of bibliographical nature; others reflect case studies associated with a specific topic, while some contain novel research material. The quality of the theses is in general high and suitable to the specific area of study.

RESULTS

Please comment on:

- *Efficacy of teaching.*
- *Discrepancies in the success/failure percentage between courses and how they are justified.*
- *Differences between students in (a) the time to graduation, and (b) final degree grades.*
- *Whether the School understands the reasons of such positive or negative results?*
-

From the student interviews the Committee conducted, the general feeling is that the theses represent a valuable component of the study program. The Committee encourages the University leadership, as well as individual tutors/instructors to engage more alumni in identifying and assigning thesis topics related to real world subject matter activities.

IMPROVEMENT

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

The Committee notes that overall the system in place is highly effective and suits the needs of the majority of the students. The latter had in general very positive comments about the contact sessions, as well as the dedication of the instructors/tutors.

The Committee recommends that tutors incorporate to the extent possible videoconferencing technology to enhance contact with their students outside the formal contact sessions.

C. Research

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

APPROACH

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

According to the University mission statement, scientific research constitutes an important agent for academic development. As per stated policy, the objective of the research agenda is to: a) enhance the education and training of University's students, both at the undergraduate and graduate level, by integrating research and education, and b) advance the scientific state-of-the-art.

The Committee is concerned that research may not be directly supported at the institutional level, either in terms of direct research funding (i.e. seed/internal research funding), research infrastructure support (e.g. capital investment for computing research infrastructure), graduate education support (i.e. scholarships for PhD candidates and post-doctoral fellows). As a result, the School of Science and Technology has limited resources to directly promote research excellence.

IMPLEMENTATION

- *How does the School promote and support research?*
- *Quality and adequacy of research infrastructure and support.*
- *Scientific publications.*
- *Research projects.*
- *Research collaborations.*
-

From the material reviewed and input collected during the site visit, it became evident to the Committee that support is limited to providing (token) travel funds for attending, mostly locally organized, conferences and workshops. The School also promotes research by organizing/hosting workshops and conferences to bring together its faculty members with researchers from other institutions. However, the Committee strongly recommends that additional resources should be provided to the School by the University administration.

Research support, including but not limited to faculty research grants and research infrastructure operating funds, should be explicitly introduced as "line items" to the University's budget and the money be transferred to the Dean's research budget.

The School's research infrastructure is insignificant and certainly not adequate. The available space, science laboratories (i.e. Physics, Chemistry and Biology laboratories), computing infrastructure, and equipment are used mostly in support of the School's educational activities.

Despite these obstacles, the Committee was delighted to observe that faculty members (i.e. Physics group) are aggressively pursuing a research agenda that includes the development of the school's research infrastructure. For example, the acquisition of a powerful computing cluster and its supporting communication infrastructure (i.e. 10 Gb routers), which was supplied recently by external funding. This is of uppermost importance since it will allow researchers and postgraduate students, affiliated with the Physics research program, to pursue a world class research agenda: participate in international experiments, i.e. at LHC CERN, and analyzing then, locally in their own computing facility, a part of the tremendous experimental data produced in these experiments. Only in this way, the contribution of the group to these "Big Science" experiments can become significant, thus enhancing its performance and international visibility considerably.

Similarly, the newly acquired research equipment within the computer science program will allow its faculty to successfully pursue effectively an agenda in multi modal human computer interaction and artificial intelligence. The Committee would like to point out that the number of technical personnel in support of the School's laboratories and research infrastructure is clearly inadequate.

In summary, the institution needs to provide significant resources in order to improve and expand the School's research infrastructure. Since major research equipment (i.e., computing clusters, large routers and switches) are expensive, operating and maintenance funds cannot come from individual research grants and projects, and thus need to be provided by the University.

RESULTS

- *How successfully were the School's research objectives implemented?*
- *Scientific publications.*
- *Research projects.*
- *Research collaborations.*
- *Efficacy of research work. Applied results. Patents etc.*
- *Is the School's research acknowledged and visible outside the School? Rewards and awards.*
-

The School's research outcome in the course of the last few years has been good and speaks strongly about the dedication and capabilities of its faculty. From 2006 to 2011 the School's faculty has participated in 47 national and international research projects. In 2010 its faculty has published 34 articles in refereed archival journals while 42 of their papers have been included in refereed conference proceedings. Moreover, the faculty has published one book and five book chapters during the same year.

The Committee noted with interest that the number of PhD candidates increased from 21 (2006-07) to 29 (2011-12). The number of PhD candidates is good given the number of full

time faculty members and the lack of financial support. It appears that the number of postdoctoral students is minimal.

Members of the faculty have well established research collaborations with faculty from other institutions in Greece, such as the University of Patras (i.e. with the Schools of Chemistry, Mathematics, Computer Engineering, and Civil Engineering), University of Ioannina (i.e. School of Physics), National Technical University (i.e. School of Chemical Engineering), Aristotle University (i.e. School of Architecture), international research centers (i.e. CERN, CE-CERT), and peer institutions abroad (e.g. Wageningen University, Vrije Universiteit Brussel) just to name a few.

It is the Committee's opinion that the School should try to be systematic in its efforts to establish research collaborations with researchers from other institutions within Greece and internationally. In this way it will be able to: a) focus its research agenda, and b) identify research activities into areas that may have near-term practical applications.

Overall the School has done a reasonable job in pursuing a research agenda, especially in advancing the state-of-the-art in some of its research fields. For example, research in the area of Experimental High-Energy Physics appears to be well recognized in terms of international research collaboration, international performance and recognition, and with respect to the publications record (more than 800 external citations in 2010).

The Committee also acknowledges the research contributions of individual faculty members in other research areas in terms of their number of publications, their participation in research consortia, and their active involvement in international conference organization. It is also noted with satisfaction that research contributions made by some of the School's junior faculty (Associate or Assistant Professors), especially in the area of information and communication technologies, have been validated with a steady stream of external citations.

IMPROVEMENT

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

The Committee's most serious concern is the absence of institutional (University level) research vision, and thus the lack of institutional support for research. Measures should be taken towards the:

- a) Continuous refurbishing and maintenance the School's research infrastructure (laboratories, computing resources, communications infrastructure). The present mode of operation where research infrastructure is financed by personal research grants and maintained, on a volunteer basis, by PhD students (and other research personnel) is not sustainable. The University should act swiftly to remedy the situation either by appointing the necessary technical personnel or by providing the

School with funds to hire graduate (PhD) students to assist in the labs (teaching/research assistantship model).

- b) Support, via internal/seed funding, of junior faculty members and emerging research leaders to ensure that they successfully secure external funding within Greece and internationally (i.e. European Union FP-7 and Horizon-2020 programs).

The Committee believes that the School of Science and Technology is under-resourced and recommends that the University establishes direct funding of the School's research operations effective immediately. It also recommends the development of additional funding sources through collaborations with Governmental agencies (i.e. The Hellenic Arm Forces, Ministry of the Environment), organizations (i.e. Green Fund), philanthropic organizations (i.e. S. Niarchos Foundation) and international granting agencies.

The Committee finds the distribution of research resources within the School uneven with the preponderance of resources being concentrated in the areas of Physics and Computer Science.

The Committee recommends that the School of Science and Technology:

- a) Enhance collaborative research endeavors that complement University's mission and make significant as well as relevant impacts on society.
- b) Place emphasis on the School's strategic research areas when considering future faculty hiring.
- c) Attract and recruit first-class new faculty, particularly from the large pool of Greek young scientists available in abroad.
- d) Increase internal funding and research resources support in underserved, within the School, research areas.

The Committee further recommends that the School of Science and Technology:

- a) Raise awareness and promote its research contributions with peers and the public.
- b) Generate synergetic research partnerships with peer institutions within Greece, strategic international partners, and industry.
- c) Support multidisciplinary efforts within the University (i.e. enhance collaboration with the School of Social Sciences – Business Program).
- d) Develop its own, School-wide, strategic research infrastructure.

The Committee believes that the School should:

- a) Strive to increase PhD enrolment and to promote a culture of excellence amongst its students. Research results at the graduate level should be presented and ranked in internal competition events.
- b) Encourage timely degree completion amongst PhD students.
- c) Engage all PhD students and more graduate students in faculty research activities.
- d) Establish an annual graduate student research review aimed at partners that support the School and its programs.

In summary, the Committee suggests that the School should strive to further develop its own infrastructure and to follow a clear research plan for the next decade. Synergy between the various sub disciplines and collaborative research efforts by faculty members, particularly those with proven experience in accomplishing research projects, is the best way to succeed. Otherwise, planless individual contributions on a long-term perspective cannot lead to academic and research excellence.

It is also important to underline in this context that the School can benefit enormously if it manages to utilize its most experienced and senior academic personnel in committees and decision-taking bodies (e.g. Research Committee, Senate, etc.) by the expected autonomy of the University.

D. All Other Services

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

APPROACH

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

The University in general offers centralized administrative support to its Schools (student registration, information technology, etc.). In addition, the School of Science and Technology employs two secretaries for its immediate needs.

There is also a University-wide Evaluation Unit («Μονάδα Εσωτερικής Αξιολόγησης και Επιμόρφωσης (Μ.Ε.Α.Ε.)») that supports the teaching mission of the School. The Committee attended a presentation by its Director Professor Xenos and was also given access to detailed records of course module evaluations of all the Study Programs for the period 2008-12.

The aims of this Unit are: (a) to evaluate all aspects of teaching at the University, including instructors, course modules, educational material and administrative services, (b) training of the teaching staff on distant education methods and (c) research on methods and procedures for quality assurance of teaching assisting technologies.

The unit has designed and developed its own electronic platform to carry out its mission. The collected data are tabulated and circulated to all parties involved in the teaching process (School administration, Directors of Study Programs, course instructors, etc.).

The Committee notes that this is a unique unit in the entire Greek University System, and was impressed by the work carried out by it.

The Committee also acknowledges the sustained efforts made by the School to set up, equip, run and maintain a University distance-access library and information service that supports both its teaching and research mission. The School's effort to disseminate information with the aid of new technologies, and thus align itself to the special characteristics of the University, should be applauded.

IMPLEMENTATION

- *Organization and infrastructure of the School's administration (e.g. secretariat of the School).*
- *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 centralized nature of administrative support at the University is efficient and economical.

RESULTS

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

The Committee judges that administrative services are overall good, as reflected by the student evaluations (average score 3.7/5) over an extended time period (2008-12) .

IMPROVEMENTS

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

The Committee considers the School's approach to be a commendable (best) practice. It believes that the entire operation together with the electronic platform of the Electronic Unit should be "advertised" to other Greek Universities. In the Committee's opinion this would result in increased visibility for the University.

The Committee is fully aware that the library's access to international journals depends on the respective service level agreements between the Greek Ministry of Education and publishing houses. Hence, timely payments by the former are essential as not to disrupt the library's operations.

Collaboration with social, cultural and production organizations

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

An interesting undertaking by selected Study Programs of the School of Science and Technology is the organization of one-day workshops attended by diverse local stakeholders, where Master Theses of the graduating class are presented. The Committee encourages all Study Programs of the School to adopt this model of dissemination of its research potential and output.

The Committee strongly recommends that the School plans targeted presentations to public and production organizations (e.g. Hellenic Armed Forces, police Schools, regional and city administrations, chambers of commerce) to educate them about its mission and its Study Programs.

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 School's:

- *Potential inhibiting factors at State, Institutional and School level, and proposals on ways to overcome them.*
- *Short-, medium- and long-term goals.*
- *Plan and actions for improvement by the School/Academic Unit*
- *Long-term actions proposed by the School.*
-

Positive factors

At the local level, the allocation of land and substantial financial support by the prefecture of Achaia for the construction of an addition to the present physical plant must be applauded and is expected to alleviate some of the University problems associated with space.

Inhibiting factors

At the state level, the lack of support for the hiring of new faculty is a most serious problem and prevents the School from reaching the critical mass needed for fully effective function.

At the Institutional level, the participation of faculty in the decision making process is virtually non-existent. As a result, non-academic administrators make decisions unaware of the consequences on the academic progress of the School.

The central (institutional) support of research by the administration is unsatisfactory considering the fact that funds are available.

Goals

At present there appear to be no short term or medium term goals, as gleaned from a close examination of the internal report.

Plan and actions for improvement.

It has been suggested in the School's internal evaluation report that:

- a) One PhD candidate is funded for every academic staff member of the School every two years. This would be a good idea, provided that the core faculty has demonstrated interest in research and proven research activity in terms of recent publications.
- b) The availability of secretarial support (one secretary for every, 3-4 faculty). This is a reasonable request and should be honored.
- c) Contiguous office space for faculty to encourage interfaculty communications.

The need for this type of space may be satisfied by the construction of an expansion of the present facilities in the Perivola campus currently in progress.

- d) An increase in the public relations efforts of the University is needed. The need of the specific education available, for the effective, optimal, operation of the private sector, public institutions, as well as the armed forces must be recognized.

Also, as pointed in the undergraduate "Studies in Natural Sciences-FYE" curriculum, the Committee encourages the School to undertake a restructuring/extension of this program, so that more "Physics Applications and Modern Technologies" are included. As a next or parallel step, the Committee recommends the introduction of a separate undergraduate program by incorporating Chemistry and Biology, with emphasis i.e. in Biochemistry and Molecular Biology. The Committee further believes that the best way to achieve it is to start this new program on the postgraduate level first.

F. Final Conclusions and recommendations of the Committee

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

Conclusions and recommendations of the Committee on:

- *the development of the School to this date and its present situation, including explicit comments on good practices and weaknesses identified through the External Evaluation process and recommendations for improvement*
- *the School's readiness and capability to change/improve*
- *the School's quality assurance.*
-

This relatively new University has developed Science Study Programs that are unique in their usefulness to the Greek educational system. They address academic issues and relate them to practical needs, important in the Greek society. This has not escaped the attention of the Greek students who show great interest in attending the University, the modest financial burden notwithstanding. The availability of post-graduate degrees that augment the graduate diplomas, lead employed, mature, educated, young people to join the "Open-University" either for training in development of their mid-course career or for a true search for new knowledge. The ministry of education should encourage and support the University and its mission, at all possible costs.

Weaknesses

- 1) The qualifying age for admission to the University, whether for pre-graduate or post-graduate degrees, is 23 years and older. It has been proposed by a faculty member, and the Committee is in full agreement, that efforts must be made to make enrollment possible for students after graduation from Lykeion.
- 2) With the exception of the small Physics Group, international scientific collaboration and excellence in research is not abundant as a whole in the School, and the one present is rather dispersed and fragmented to a few individual faculty members.
- 3) The School's current research orientation and practice appear to be mainly theoretical in their approach, thus calling urgently for the establishment of dedicated research infrastructure and research laboratories.
- 4) Research results at either the post-graduate masters or PhD levels should be presented and ranked in internal competition events. The winning entries should be rewarded with financial support for student travel, and presentation of results to national or international meetings. The award of a PhD diploma should have as a prerequisite, without any exception,

the publication results in at least one professionally acceptable journal.

5) The quality of many of the texts available for instruction has been questioned. The majority of the students interviewed, during the Committee's in-site visit, expressed dissatisfaction with the presentation of the material, the volume (excessively large), and the usefulness of these texts as course aids. This situation clearly must change. School-generated texts must be periodically evaluated. Comprehensive and systematic reviews of all textbooks should be carried out. Input from both faculty members and students should be solicited. Outdated or unsatisfactory textbooks should be replaced by other texts available in the Greek literature. Alternatively, the availability of English language texts as either an available, no-cost, option or library "holding-in-reserve" reading material must be seriously considered.

6) The School should intensify its effort to enhance library holdings. The textbook and course related holdings and collections should be expanded. Further efforts should be made to enhance the, already impressive, library's physical space. The Committee is fully aware that timely payments by the Greek Ministry of Education are essential as not to disrupt the library's operations and restrict student access to pertinent literature.

7) The on-line availability of lectures and other course material is acceptable but in the Committee's view the service could be further improved. The program is popular with the students and apparently in high demand. It should be maintained and increased in scope.

The School is definitely capable and ready to change and improve. Indirectly this is evident in the enthusiasm of the teaching staff in interacting with their students. In turn the students recognize and appreciate this willingness of the professors to interact and help. Indeed there is no other University in Greece with the mutual respect displayed by the students and professors of the Open University. It must be recognized that, on the basis of the teaching loads, the present small number of teaching staff will be hard pressed to introduce changes. The addition of new faculty, as full or adjunct members, will be necessary.

Conclusive evidence of the improved quality of the University is apparent in the increase in enrollment and graduation rates of the students in the various Studies Programs. As indicated previously for this momentum and interest to be maintained, it will be necessary to increase the number of faculty and also of the physical plant that will accommodate faculty and students.

Final statements:

The following final statements of the Committee are applicable not only to the School of Science and Technology but also to the entire University, and should therefore be addressed and seriously considered by the current and future governing authorities of the University.

Recruitment strategy.

The Committee strongly believes that the School, and the University as a whole, as a relatively young academic institution, would have had the best prospects to attract and hire from the very beginning first-class scientists, especially from the large pool of Greek scientists in abroad. Therefore, the Committee suggests to widely and timely advertise all future faculty positions, both in print in well-known international journals and electronic databases, and to recruit only those candidates, if they meet a high standard of academic excellence.

As a matter of fact, the Committee noted that most of the existing academic personnel of the School (~60%) stems from, or is indirectly related to, the nearby University of Patras. This practise may eventually lead to "in-breeding" and to an influence that may have adverse effects in the diversity of the University. Clearly, such practices should be avoided in the future.

Selections criteria to the external “Tutors” («ΣΕΠ») Personnel.

It is the Committee’s strong conviction that the role of the external tutors is indispensable for an unhindered functioning of the various studies programs that the University offers. On the other hand, there is a rather large number of tutor applicants in each year and their number is expected to increase due to the current economical crisis in Greece with the high unemployment, particularly between young scientists. Therefore the School and the University more generally should apply well-defined tutors selection criteria based on transparency, academic competence, professionalism and enthusiasm in teaching, etc. Towards to this end, the Committee would like to recommend additionally the followings:

1. Tutor rotation: No tutor should be allowed to serve longer than three consecutive years in the same course module offering. Based on academic qualifications a tutor maybe assigned to a different course module.
2. Members of the School’s tutors’ evaluation committees should be appointed annually. No members shall serve on the same committee for more than two consecutive years.
3. External Program Director appointment: No Director should be allowed to serve longer than three consecutive years with the exception, of five years term, for those who are designing and starting a new program.

Concerning the budget of the University:

The Committee requested and analyzed the annual budget of the University for the last 6 years (2007-2012). According to the budget of the last economic year (2012) the income was about 26 MEuros, from which the amount of 23.24 MEuros (~90%) came from the student's fees and 2.61 MEuros (~10%) from the state. If one includes additional income due to cumulative interest from previous years etc., the total income amounts to 34.7 MEuros. In the same time the total annual expenses were 27.6 MEuros, so that a surplus value of about 7 MEuros was obtained. A similar behavior was observed for the other years considered. The Committee greatly appreciates the careful budget management by the University authorities over the past years and would like to make the following comments/suggestions:

1. An amount of ~700 kEuros (~10% of the surplus) should be allocated for fellowships to postgraduate's students, with emphasis in PhD candidates, based on merit and academic performance. This amount would cover around 70 fully supported fellowships per year (~800 Euros per month each) and represents a first step. Future increases may follow budget improvements and rationalization of expenses.
2. The establishment of an amount of 3-5 kEuros per year per academic staff member of the University for research activities (i.e. international collaboration, travelling costs, scientific conferences, etc.). This corresponds currently to 2-3% of the surplus of the year 2012 and should be allocated to the University research committee (to be formed if it does not exist) for evaluation and further distribution to the academic staff upon well-defined scientific criteria.
3. The establishment of an amount of ~10% of the annual surplus (i.e. about 700 kEuros for the year 2012) for maintenance and upgrade of the existing computing and laboratory infrastructure as well as for the supply with new instrumentation. This is essential to keep running and improve the educational and research capabilities of the School. Note here that according to the international practice ~10% of the value of an existing instrument/infrastructure is annually needed for its maintenance/upgrade.

Last, the Committee believes that some of the costs, as shown analytically in the budget of the year 2012, can be rationalized and probably drastically reduced; i.e. "remuneration of other individuals who perform special services" of 1.96 MEuros (article 0429 in page 3 of the budget) or "travelling costs of third parties within Greece" of 622 kEuros (article 0771 in page 4 of the budget), and so on.

G. APPENDIX

Acronyms of the various course modules used in this report. Numbering and Greek nomenclature is according to the contents of the official University “Studies Guide” («Πρόγραμμα Σπουδών», in Greek).

SCHOOL OF SCIENCE AND TECHNOLOGY

Undergraduate Programs

1. **ΠΛΗ:** Πληροφορική -
PLI : Computer Science
2. **ΦΥΕ :** Σπουδές στις Φυσικές Επιστήμες -
FYE: Studies in Natural Sciences

Postgraduate Programs

1. **ΠΣΠ:** Περιβαλλοντικός Σχεδιασμός Πόλεων και Κτιρίων -
PSP: Environmental Design of Cities and Buildings
2. **ΠΣΕ:** Περιβαλλοντικός Σχεδιασμός Έργων Υποδομής-
PSE: Environmental Design of Infrastructure Works -
3. **ΔΠΗ:** Διασφάλιση Ποιότητας –
DIP: Quality Assurance
4. **ΣΜΑ:** Σεισμική Μηχανική και Αντσεισμικές Κατασκευές -
SMA: Earthquake Engineering and Seismic Resistant Structures
5. **ΔΧΤ:** Διαχείριση Τεχνικών Έργων -
DCHT: Engineering Project Management
6. **ΠΑΣ:** Μεταπτυχιακή Εξειδίκευση στα Πληροφοριακά Συστήματα -
PLS: Information Systems
7. **ΚΦΕ:** Μεταπτυχιακή Ειδίκευση Καθηγητών των Φυσικών Επιστημών -
KFE: Teaching Natural Sciences
8. **ΜΣΜ:** Μεταπτυχιακές Σπουδές στα Μαθηματικά -
MSM: Postgraduate Studies in Mathematics
9. **ΠΣΦ:** Προχωρημένες Σπουδές στη Φυσική -
PSF: Advanced Studies in Physics
10. **ΚΠΠ:** Κατάλυση και Προστασία του Περιβάλλοντος -
KPP: Catalysis and Environmental Protection
11. **ΔΙΑ:** Διαχείριση Αποβλήτων -
DIA: Waste Management
12. **ΣΔΥ:** Τεχνολογία Υλικού και Λογισμικού: Σχεδίαση και Ανάπτυξη Διάχυτων Συστημάτων Υπολογισμού -
SDY: Engineering of Pervasive Computing Systems

The Members of the Committee

Name and Surname	Signature
1. Professor Dimitris Coucouvanis	
2. Professor George Michailidis	
3. Professor Konstantinos Plataniotis	
4. Professor Charalambos Tsertos	