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ΑΡΧΗ ΔΙΑΣΦΑΛΙΣΗΣ ΚΑΙ ΠΙΣΤΟΠΟΙΗΣΗΣ ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

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

EXTERNAL EVALUATION REPORT

DEPARTMENT OF CIVIL ENGINEERING

UNIVERSITY OF PATRAS

European Union
European Social Fund

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

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

1. Professor Nikolaos Katopodes (President)
   University of Michigan at Ann Arbor, MI, USA

2. Professor Michael Constantinou
   University at Buffalo, State University of N.Y., N.Y. USA

3. Professor Spiros Pagiatakis
   York University, Ontario, CA

4. Professor Panos Papanastasiou,
   University of Cyprus, CY

5. Professor S. J. Pantazopoulou
   University of Cyprus, CY

Introduction

I. The External Evaluation Procedure

Dates and brief account of the site visit.

The External Evaluation Committee (EEC) visited the Department of Civil Engineering at the University of Patras during the period from Wednesday December 11, 2013, to Friday afternoon December 13, 2013. The visit schedule followed the planned itinerary provided by the department as follows:

In the morning of Wednesday, December 11, 2013, a brief introduction was given on the scope of the evaluation by Professor Constantine D. Memos (Member of HQA) at the offices of HQAA in Athens. The team arrived in Patras in the afternoon of Dec. 11. Upon arrival, the EEC met with the Rector of the University, Deputy Rector of Academic Affairs, the Dean of the School of Engineering, members of the University Evaluation Unit (MODIP), the Chairman of the Department and the members of the Department Evaluation Committee (OMEA). Next the EEC met with the Departmental OMEA in the facilities of the department, where the Department Chairman (Professor A. Demetracopoulos) made a detailed presentation of the organization and functions of the department. Presentations followed by (a) Professor Dimas on the structure and objectives of the undergraduate curriculum, (b) Professor Chassiakos on the Postgraduate Program, (c) Professor Triantafillou on the International Postgraduate Programs. (d) Professor Dritsos presented the Internal Evaluation Report.

On Thursday, December 12, presentations were made in the departmental facilities as follows: (a) By Dr. Karantoni on Practical training of the students, (b) By Professor C. Papanicolaou on mobility programs available to the students (Erasmus exchange).
Next, representatives of several divisions of the faculty presented outlines of the research activities of the respective faculty groups as follows:
- Geotechnical Engineering (G. Mylonakis)
- Applied Mathematics (E. Petropoulou)
- Hydraulic Engineering (B. Kaleris)
- Environmental Engineering (P. Yannopoulos)
- Transportation Engineering, Project Management (A. Chassiakos, Y. Stefanides)
- Structural Engineering (D. Karabalis, S. Bousias, C. Papanicolaou)
- Geomatics (S. Stiros)
- Architectural Technology (D. Verras)

The EEC also met separately with undergraduate and graduate student groups.
The program also included visits to many laboratory facilities of the Department maintained by the divisions (Hydraulics, Geotechnical, and Structures Laboratories). Next the EEC visited the Seismic Simulator, Structural Materials Laboratory, Environmental Engineering facilities, Surveying and Geomatics, and the Architectural Technology studios.

On Friday December 13, the agenda continued with presentations by the Secretarial (Ms. Stamiri) and Administrative staff, and other Special Support groups. The EEC visited the offices of departmental administration, the university library, the Engineering Sciences Computing Lab, the drawing/graphics facilities (for teaching of first year undergraduate courses), Classrooms, the Mathematics Computing Facilities, the University Conference Center, the Athletics Center, and the Stavropoulio Dormitory which is used for hosting Erasmus and Graduate Students. Last, the EEC met with the Vice Rector of Financial

Affairs, the Dean of the School of Engineering, members of the University Evaluation Unit (MODIP), the Chairman of the Department and the members of the Department Evaluation Committee (OMEA) to conclude the meeting.

On Saturday December 14, the EEC convened to author the present report. This activity continued throughout the day of Saturday and Sunday December 15, 2014.

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

Members of the Committee reviewed several samples of teaching materials, class notes, textbooks, assignments, and theses. The EEC also had at its disposal internal evaluation reports for the period of 2007-2011 and a revised report covering the period from 2007 to 2013. The reports provided a full overview of the teaching and research activities of the department, undergraduate and graduate study guides, detailed description of all courses, and CVs of the faculty members.

II. The Internal Evaluation Procedure

Appropriateness of sources and documentation used

The internal report was thorough and extensive including information on several aspects of the departmental activity.

The various quantitative comparisons regarding the output of this department with other civil engineering departments in the country were very informative. The information provided was focused on mean performance indices, but there was also some evidence regarding the distribution of activity by individual faculty members.

Quality and completeness of evidence reviewed and provided

The furnished reports reflect accurately the current status of the department. They clearly describe the structure, organization and facilities of the department, and provide an adequate picture of teaching and research activities as well as the scope and capacities of the laboratory facilities.

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

The objective of the internal evaluation report was to provide accurate, quantitative information on several performance indices reflecting the overall state of the department. The internal evaluation concluded with an extensive list of positive and negative aspects of the department's performance as a whole with reference to (a) Teaching, (b) Research, and (c) Service to the Community. However, the report did not present any specific objectives or goals – possibly due to lack of experience or standardization procedures regarding such evaluation processes.

A. Curriculum

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

UNDERGRADUATE CURRICULUM

APPROACH

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

The goals and objectives of the curriculum were not specifically listed; however, it is assumed that they reflect those of the department. Namely: *The best training and education of the students, their preparation for continuous acquisition of knowledge, service to the community, and the assumption of leadership positions. It (the department) pursues excellence in promotion, collection, and dissemination of knowledge in the Art and Science of Civil Engineering*. The plan is to cover the breadth and depth of Civil Engineering by delivering numerous courses in all areas of specialization.

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

The objectives were decided with particular reference to traditional approaches followed by all other engineering schools in the country, and the Technical Chamber of Greece (professional rights of the graduates). There is no evidence of consultation with other stakeholders in the community. Also, there is no comparison with undergraduate curricular trends of modern programs in civil engineering or the requirements of international accreditation boards.

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

The curriculum is consistent with its own objectives, albeit in an excessive manner. However, the requirements of the society which are continuously evolving require a commensurate evolution of the curriculum – this is not happening, to the extent that several of the prevalent and emerging societal needs (sustainability, alternative energy sources, and green construction) are not relevant with the focus of the program.

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

The curriculum was decided exclusively by the General Assembly of the department based on the recommendations of the Undergraduate Program Committee. The student representatives also participated in this process.

Has the unit set a procedure for the revision of the curriculum? The unit has an annual process of curriculum revision.

IMPLEMENTATION

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

Heavy emphasis in the curriculum is placed on teaching with little effort to evaluate learning. The content of the senior level courses belongs well into the range of graduate curriculum.

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

The number of weekly contact hours is deemed excessive (25 hours per week) in

comparison with modern curricula which are based on a 15-18 hour plan. Also, the number of offered courses is excessive leading to fragmentation and multiple final examinations with no integration. There is a lack of multi-disciplinary projects that could serve this goal (e.g. a capstone design project, coordination of projects of different courses, etc.). The students graduate with no experiences regarding non-technical skills such as entrepreneurship, innovation and discovery, engineering ethics, an appreciation of what is important in engineering practice, the ability to make decisions in the face of uncertainty, and to work with open-ended problems.

Is the structure of the curriculum rational and clearly articulated?
Yes, in light of the criteria guiding its formation.

Is the curriculum coherent and functional?
The number of courses leading to graduation is large (56 in total). Note that competitive programs in civil engineering in other countries do not exceed 40 courses. The absence of prerequisite enforcement and the multiple examinations result in loss of focus and reduction of effectiveness in the delivery of the program. Here the points made earlier about fragmentation in large numbers of offered courses and lack of integration in multi-disciplinary projects are recalled.

Is the material for each course appropriate and the time offered sufficient?
Some courses may be considered obsolete in light of new technologies (e.g. technical drawing). Some fifth year courses could belong to graduate programs. Also, some of the courses have a disproportionately great emphasis on theory instead of application examples.

Does the Department have the necessary resources and appropriately qualified and trained staff to implement the curriculum?
By comparison to other Universities in Greece, with the same or smaller number of students, the number of faculty is rather small. Therefore, the faculty to student ratio is about 1:40 (when considering active students only), and 1:50 when considering all enrolled students in the department. Another significant point here is that the Program admits too many students as compared to the number of admissions proposed by the department, based on decisions by the State: An internationally accepted standard is 80 students a year, whereas 200 students are admitted annually based on the pan-Hellenic entrance exams.
Another significant issue, partly due to the large number of students, is that the low faculty to student ratio inhibits the ability to introduce alternative means of student performance evaluation (through mid-terms, assignments, etc.). To supplement the dire need for teaching support, the faculty involves the graduate students in the role of teaching assistants to grade papers and to conduct tutoring sessions. Due to lack of funding of teaching assistants, there is a misuse of doctoral students in teaching duties and marginal pay.

RESULTS

How well is the implementation achieving the Department's predefined goals and objectives?
As documented in the preceding analysis, the Department's objectives would be better served through extensive revision of the curriculum.

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

Too many external constraints are imposed on the implementation and objectives of the curriculum. The department has made several attempts to contact the State's Department of

Education to no avail.

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

Yes, the department understands clearly the program's advantages and disadvantages, the constraints under which it operates, and the necessary changes for improvement.

IMPROVEMENT

Does the Department know how the Curriculum should be improved?

Yes, but they might need to seek input from other modern programs.

Which improvements does the Department plan to introduce?

Revision of their undergraduate curriculum aimed at reducing the number of courses.

A. Curriculum

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

GRADUATE AND DOCTORAL CURRICULUM

APPROACH

The program admits approximately 35 students per year. The duration of the studies for the Master of Sciences program is 2 semester minimum to a maximum of 3 semesters. The degree requirements comprise 8 graduate courses plus a graduate thesis. Courses are selected from a range of available options organized in four directions (Earthquake Engineering, Geotechnical Engineering, Water Resources and Environmental Engineering, Transportation and Construction Project Management). The requirements are within the range of European-wide norms (Master of Science for 90 ECTS). The students that participate in the International Programs (e.g. MEEES and EU-Nice) are given opportunities to attend courses or to conduct research in other collaborating European Universities.

A rigorous procedure is used to screen the candidates. No fees are charged at the graduate level. This program also serves as the basis for satisfying the course requirements of the PhD program.

IMPLEMENTATION

A broad selection of courses is offered. The thirty-five students admitted are divided among the four directions averaging about 15 students per year in Earthquake Engineering, and about 6-8 students in the other three directions. The number of students per direction is relatively small in some of the directions, if a long term sustainability of the program is to be achieved. Approximately one in two Master students continues on to pursuing a doctoral degree.

RESULTS

The graduate program is particularly effective for doctoral candidates. However, for Master students there is some degree of overlap with advanced undergraduate electives, thereby occasionally limiting the choices of courses they could enroll to, so as to maintain relevance with their thesis. An important systemic limitation is that they cannot enroll (for credit) in

graduate courses from other departments which could provide them with the opportunity to specialize in novel technologies (e.g. sensors, passive and active control) that require training in other, non-civil engineering subjects. Doctoral students are strongly encouraged by their advisers to publish extensively in international refereed fora, and some graduates have had success in receiving offers for faculty positions abroad. The students expressed a great degree of satisfaction with their professors, the graduate learning experience, facilities, and access to literature. The students complained for lack of fellowships, excessive workload in their unpaid or underpaid TA-ship role, and an overall struggling financial status.

IMPROVEMENT

Clarify and distinguish the knowledge objectives of the graduate curriculum from the advanced (5th year) undergraduate program to limit overlaps. Improve intra-sectional cooperation (enhance multi-disciplinarity). There are two potential remedies to be considered at this stage: either revise the undergraduate program to a four year course cycle, so that the two programs are complementary (reduce overlaps), or conduct the graduate coursework entirely in English. Consider also allowing joint course offerings at the fifth year of studies and the first year graduate program. The introduction of tuition fees for the master program should be considered as a possible means of funding TA-ships for the doctoral candidates. The quality of the program depends strongly on the quality of the doctoral students, and this point should be ranked high in the priorities of the department.
It should be noted that students employed in research laboratories ought to receive formal training on health and safety issues.

B. Teaching

APPROACH

The overarching principle of the teaching philosophy of the Department is to provide sufficient basic and specific knowledge in Civil Engineering through core and elective courses that lead to applied projects towards undergraduate and graduate research (MSc and PhD) degrees.

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

Teaching methods primarily employ the traditional classroom lectures based on white/chalk board and electronic projection facilities. The content of the courses has been gradually updated in several stages according to the faculty. The majority of the faculty members of the Department have published their own textbooks. In addition, the instructors have been using textbooks from other Greek Universities, or they recommend a limited number of textbooks in English. Most course lectures, notes, and homework assignments are available through web resources and multimedia (e-class). The current overall faculty workload and strong focus on research does not always allow them to be readily available for the students despite the fact that many have specified office hours. The average duration to complete the undergraduate degree is 6.5 years (in the academic years 2005-2013), whereas the average course grades seem to be relatively low (6.7 average GPA).

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

The ratio of the overall teaching staff to the number of active undergraduate students (n+2 years of study) is 1/40. Taking into account the total number of registered undergraduate

students, the overall faculty to undergraduate student ratio is 1/50. The minimum teaching load requirement (State requirement) for each faculty member is 8 h/week. This assignment seems to be high for a research–oriented faculty, taking into consideration: the examination load of the instructors and the extensive time they have to invest in teaching laboratory and graduate courses, the absence of teaching fellowships for graduate students and limited technical staff.

The EEC feels that three-hour continuous lectures are not effective, as they are not conducive to true learning and must be split to shorter segments. Likewise, courses with five hours of lectures per week must appropriately be split to short lectures spread throughout the week. Course outlines and course contracts are described in the ECTS catalog found in the web page of the department, but there were some complaints by the students that are not always followed. Also, labs and assignments that usually involve a lot of work are not reflected on the final course grade.

Teacher/student collaboration

The EEC's meeting with the undergraduate students revealed that there is a significant gap in communication and collaboration between undergraduate students and academic staff. The picture is different with the graduate students who seem to be very content with their professors and supervisors.

Adequacy of means and infrastructure resources

The Department is very well equipped with state-of-the-art facilities and equipment in all three Divisions. The classrooms are adequate in number vis-à-vis the current method of course delivery, and are properly equipped. The teaching laboratories are kept in excellent shape through strong commitment and collaborative efforts. However, there is a clear lack of support from qualified technical personnel. Furthermore, it appears that the undergraduate students have rather limited access to certain laboratory facilities that are mainly used as research hubs. Field trips are very limited and often absent from certain courses that require them.

The Department has small Division libraries and access to the central university library both with wireless internet available via many on-site workstations.

Use of information technologies

Computer equipment and internet resources are widely used including online bibliographic databases, electronic books and limited wireless internet access. A dedicated departmental computational facility with several personal computers is available to the students within the Computing Center, although the student to computer ratio appears to be high. However, the operation hours of the Computer Center seem to be inadequate for the increased needs for assignments and lab report preparation, whereas the lack of Wi-Fi hot spots around the Department poses additional constraints to the students regarding the availability of computing power.

Examination system and assessment of course work by the students

Assessing the performance of students in each class is carried out through written final exams, and in certain courses the final grade is a combination of the final exam and to a much lesser extent of laboratory work. A questionnaire for the assessment of the quality of the courses is used. The Quality Assurance Unit (MODIP) of the University recently administered the first electronic course evaluation.

IMPLEMENTATION

Quality of teaching procedures

The teaching methods are adequate overall with some exceptions of high quality. There is a lot of room for improvement that can include further implementation of e-resources, blended course delivery, and improved hands-on experience.

Quality and adequacy of teaching materials and resources.

The EEC notes that teaching material and instrumentation vary from adequate to excellent and are updated frequently.

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

The lecture material in many of courses is in electronic form, and appears to be reviewed and updated frequently. A move towards more materials in electronic form is recommended.

Linking of research with teaching

The mandatory Diploma Thesis in the undergraduate curriculum provides students with a first-hand practical and often research experience which may also link with industry. The EEC feels that the current form of Diploma Thesis does not necessarily promote exposure to cross-disciplinary experience that is characteristic of modern engineering design projects. Perhaps an improved form of this activity will allow participation of students from different disciplines (capstone project) and will promote strong engineering design experience.

For those students that enter the MSc program, the link between experimental research and teaching is clearer, and as a result of this it provides a better opportunity for employment and professional career development. However, the EEC feels that the highly developed and strong research efforts in the department do not adequately permeate down to the senior years of the undergraduate study.

Mobility of academic staff and students

The Practical Experience Program (Internship) provides the opportunity for undergraduate students to get practical experience within industry for a period of six months. Unfortunately, this program is vulnerable to economic turn-down periods when the availability of positions is severely limited.

Within the ERASMUS MUNDUS program, the Department collaborates with several other European Universities to provide high level graduate studies leading to MSc in Science in Earthquake Engineering. This program has given 213 students from 53 countries the opportunity to spend 18 months in participating Universities since 2005/06 academic year, and has awarded 147 joint MSc degrees. The Department also participates in the EU-NICE project that provides higher education and cooperation among institutions located in seismic-prone European and Asian counties by exchange of scholars.

The majority of the faculty members are involved in various collaborative research programs primarily in Europe. These efforts are impressive and should be maintained in the future.

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

During the discussions with the students, their assessment of teaching and course content and study material/resources appears to be marginal. However, this view of the students was not consistent with the earlier course assessments that were presented in the self evaluation report, which suggests that the quality of teaching and teaching materials is above ‘very good’ for 50% of the courses. Notwithstanding this fact, the issue of teaching

quality can be remedied, to large extent, by introducing important improvements by enabling feedback provided by the students and should be made through various forms, such as town-hall meetings, discussions at the course level, using unified questionnaires and other forms as deemed appropriate and effective by faculty, staff and students.

RESULTS

Efficacy of teaching

Currently there is no formal assessment of teaching efficacy. The EEC recommends that the department develops a process for measuring the outcomes of teaching through assessment of actual student learning and depth of comprehension.

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

The average undergraduate student in the years 2006-2013 achieved a final degree grade of 6.7/10. Time to graduation averages at 6.5 years (academic years 2006-2013) which is longer than the expected five years.

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

The department believes that the reason of the current length of graduation time is due to: (a) the lack of prerequisites, (b) the lack of an upper bound in the duration of studies (up to now), (c) the lack of mandatory attendance for all courses, (d) the large student to faculty ratio, and (e) the Greek admission system which does not guarantee that all students enter the department of their first choice. The EEC agrees with these reasons and suggests other possible reasons such as (f) the large number of final examinations allowed following failure in course(s) related to (b) above; (g) the heavy course load (h) the need of certain students to support their educational expenses by working; and (i) the lack of financial support that influences the level and quality of available infrastructure of education.

IMPROVEMENT

Does the Department propose methods and ways for improvement?

The Department is poised to introduce modern methods and other ways of improving teaching, and has made numerous detailed suggestions for improvement in their Internal Evaluation Report.

What initiatives does it take in this direction?

The Department has made several important suggestions for improvement in their Internal Evaluation Report, with which the EEC fully agrees.

The EEC strongly recommends that the Department make considerable effort to find effective ways of increasing classroom attendance at the undergraduate level.

The EEC recommends that uniformly high grades for the MSc degree be avoided, and instead a more objective and wider grading scale range be used. In addition, and in an effort to improve the quality and objectivity of the assessment, it is recommended that an external evaluator be introduced with an equal percentage of contribution towards the final grade for the MSc Thesis.

The number of undergraduate students admitted should be reduced significantly.

C. Research

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

- APPROACH

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

To conduct world class research in civil engineering.

Has the Department set internal standards for assessing research?

The department uses established criteria to assess their research output, such as their international ranking (they are within the 51-100 top departments worldwide according to the QS ranking system), the h-indices of the faculty members, their paper numbers, their citation counts, and comparisons of these performance indicators with those of other departments in the country. The number of citations is high not only for the overall group, but also in the individual sectors across the board. The department attracts impressive amounts of competitive international and national research funding on a continuous sustained basis.

- IMPLEMENTATION

How does the Department promote and support research?

- Invests a large fraction of the TSMEDE funds on a rotational basis to the groups in order to buy equipment or to develop research facilities.
- Assigns a high weight to scholarly publications for tenure and promotion consideration

Quality and adequacy of research infrastructure and support.

Research infrastructure is excellent, however, support in the form of technical staff is almost completely lacking.

Scientific publications.

Outstanding, but unevenly distributed among the faculty

Research projects.

A large number of projects is currently active covering both theoretical and applied research. Technical teams from the department have a long standing continuous presence in significant international consortia.

Research collaborations.

The collaborations are mainly with groups outside the country. There is limited interdepartmental collaboration. Members of the faculty are involved in several international and national Standardization Bodies, thereby providing significant service to the profession at the National and International scale.

- RESULTS

The Department's research objectives are implemented very successfully. As mentioned in the preceding analysis, each group/division produces a significant number of publications receiving a respectable number of citations. Some faculty members have received prestigious international awards.

- IMPROVEMENT

The department has requested additional technical support for its laboratories. Some laboratories have diverted funds from applied research towards hiring laboratory staff.

D. All Other Services

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

- APPROACH

How does the Department view the various services provided to the members of the academic community (teaching staff, students).
Residence facilities are a limited resource. Housing available for undergraduates needs refurbishment. Many more such facilities would be necessary to cover the student's housing needs.
An inhibiting factor is lack of electronic organization of the administrative services required for management of the student files. There is no streamlining of activities. The Department recognizes this problem and is currently opting for the so-called electronic step forward.

- IMPLEMENTATION

The secretariat of the department operates using traditional filing methods. The secretariat handles an immense number of different tasks that would be greatly simplified following the introduction of electronic procedures.

Access to the internet is only available in specific hot spots on campus. The students need longer access hours to the computer labs. Their athletic facilities are very good, and there is interesting cultural activities going on (e.g. live streaming from the N.Y. Metropolitan Opera). The organization on an annual basis of a Student Conference represents a great experience for the students. They have the opportunity to take pride in presenting complete papers which they author in partial fulfilment of course requirements.

- RESULTS and IMPROVEMENTS

The administrative services work hard to meet the needs of the department despite the excessive number of students they serve. There is, however, great concern about the uncertainty in the status of non-permanent staff. There is hope that many of the problems will be streamlined when the shift to electronically-based operation will be fully implemented.

Collaboration with social, cultural and production organizations

The department has provided great contributions to the profession at both the International and National levels. The presence of faculty members in drafting Eurocode 8 (Seismic design code), the Greek Retrofit Code (KANEPE), the Greek Code for Assessment and Retrofit of Unreinforced Masonry Structures is commendable. Also, the department has provided significant services to the University through the participation of its members in Technical Services Committees of the University.

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.

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

Inhibiting factors at the department level are: (a) The lack of technical support in the

laboratories (highly skilled technicians). (b) The lack of fellowships and funding of the graduate student teaching assistants. (c) The lack of a dependable communication platform between faculty and undergraduate student groups. (d) The lack of electronic organization of the secretariat. (e) The uncertainty in the status of the administrative personnel. (f) The large numbers of students in classes. An additional threat for the sustainability of certain sectors is the retirement without replacement of faculty and staff (e.g. Geotechnical division, Steel structures, Surveying).

Inhibiting factors at the University level are: (a) The lack of autonomous status of the University from the State so as to be able to independently manage policies, (b) The excessively low operational budget which places significant constraints on the freedom to make budgetary policies. (c) There is inertia and hesitation in radically changing policies due to overregulation through a continuously changing legal framework.

Inhibiting factors at the State level are: (a) The excessive interference on the part of the State on the minutia of operation (e.g. how many examination periods are to be conducted and when). (b) The interdependence with other programs in Civil Engineering since professional rights are directly linked to the degree. Changes must be pursued upon coordinated agreements between the participating Civil Engineering departments from all Greek Universities, the stakeholders and the professional chambers.

The department is sincerely willing to improve its function and output and is very progressive and pro-active in this direction. They are keenly interested to take actions at all levels so long as the current status of the administrative personnel is finalized. Their first priority is to upgrade the function of the secretariat though modernization.

F. Final Conclusions and recommendations of the EEC

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

The EEC was positively impressed by the Department of Civil Engineering at Patras. This is an outstanding department with some exceptional, world-renowned faculty members. The committee was particularly impressed by the modern facilities, the world-class research infrastructures, and the scientific output and research record of the department. The department's record and facilities are comparable to those of the best European and many American Universities.

The State allocates a disproportionately large number of undergraduate students to the department with respect to the number of faculty, especially when compared to other Greek Universities. This stifles the departmental resources and stretches the personnel and faculty time to their limit.

GENERAL RECOMMENDATIONS

The Department has the potential to enhance its international ranking and teaching effectiveness even further by considering a number of improvements. Possible actions include the following:

- Reduce the number of contact hours in the undergraduate curriculum (number of hours in the weekly program of student attendance of lectures).
- Introduce a Capstone design course/project which will give the students the opportunity to

combine engineering concepts from different disciplines of civil engineering practice (e.g. structural design and environmental implications associated with major development projects).
- Reduce the student to faculty ratio.
- Focus teaching on open-ended problem solving with emphasis on uncertainty.
- Reduce the numbers of courses and strengthen the scope and breadth of those that are retained in the program – match the international trends in undergraduate curricula.
- Follow strictly the ECTS guide provided in the web page of the department. For each course the ECTS guide specifies the policies of contact between student and instructor and provides details on the material to be covered, the objectives and outcomes, and the process of evaluation of student performance. Finally, an assessment method should be articulated for the course outcomes.
- Introduce a 1st semester orientation course which includes an early project design to develop intuitive capabilities on solving open-ended problems.
- Address the deflation of student grades by introducing scaling in grading – this will eliminate the current disadvantage of the department's graduates when pursuing scholarships or employment. Redesign the curriculum and evaluation procedures so that the final grade is based on more than one ways of assessment of student work (e.g. combination of quizzes, projects, homework, and finals).
- Enforce pre-requisites and restructure the undergraduate curriculum in order to streamline the program and to increase its effectiveness.
- Initiate collaboration with other civil engineering departments and all stakeholders (e.g. Technical Chamber of Greece) in the direction of reducing the duration of the 5 year program to a 4 year program – Greek graduates are disadvantaged as compared to their international peers because they spend excessive time to obtain the same qualifications. With this change the graduate program will gain in significance and momentum.

- The University should find alternative ways to secure funding for teaching assistants (doctoral students).
- The graduate program should be restructured in light of its continuation and overlap with the senior undergraduate courses.
- The Department should consider offering all graduate courses in English in order to improve the competitiveness of its graduates in the European Job market.

- The existing organization of the department in Divisions should be restructured to improve synergies and interaction between disciplines.
- There should be collaboration between departments for the development of interdisciplinary programs (energy sources, natural resources, signals and sensors / monitoring, control, etc.).
- The Department should actively pursue a program of mentoring junior faculty and to increase diversity in the faculty to reflect national demographics and to provide role models for the students.
- The Department should address the issue of vulnerability in maintaining its research profile regarding the impending retirement of senior faculty, especially in light of the current limited replacement ability.
- The Department should eliminate the uncertainty regarding the final number of support personnel as soon as possible. Alternative ways should be found to secure funding in this direction by utilizing research or discretionary funds.
- Establish a formal advising process for undergraduate students. The faculty should take an active role in mentoring undergraduate students on academic values. Each faculty

member should be assigned a number of advisees for the entire period of the student's academic life.

- The State must recognize the benefits of granting autonomy to Academic Institutions. Over-regulating the Academic Procedures has created a culture of deflecting responsibility and accountability at the University and the Department level. Schools and departments should be allowed to pursue high risk – high reward endeavors that will foster innovation and provide solutions to the problems facing Greek Education, Economy and Society in general.

The Members of the Committee

Name and Surname Signature

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