



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
HELLENIC REPUBLIC



Εθνική Αρχή
Ανώτατης Εκπαίδευσης
Hellenic Authority
for Higher Education

Αριστείδου 1 & Ευριπίδου 2 • 10559 Αθήνα | 1 Aristidou str. & 2 Evripidou str. • 10559 Athens, Greece
T. +30 210 9220 944 • F. +30 210 9220 143 • E. secretariat@ethaae.gr • www.ethaae.gr

Accreditation Report
for the Undergraduate Study Programme
(Integrated Master) of:

Civil Engineering
Institution: National Technical University of Athens
Date: 6 March 2021

Report of the Panel appointed by the HAHE to undertake the review of the Undergraduate Study Programme (Integrated Master) of **Civil Engineering** of the **National Technical University of Athens** for the purposes of granting accreditation

TABLE OF CONTENTS

Part A: Background and Context of the Review	4
I. The External Evaluation & Accreditation Panel.....	4
II. Review Procedure and Documentation	5
III. Study Programme Profile	7
Part B: Compliance with the Principles	8
Principle 1: Academic Unit Policy for Quality Assurance.....	8
Principle 2: Design and Approval of Programmes	10
Principle 3: Student- centred Learning, Teaching and Assessment.....	13
Principle 4: Student Admission, Progression, Recognition and Certification	16
Principle 5: Teaching Staff	18
Principle 6: Learning Resources and Student Support	21
Principle 7: Information Management	23
Principle 8: Public Information	25
Principle 9: On-going Monitoring and Periodic Internal Review of Programmes	27
Principle 10: Regular External Evaluation of Undergraduate Programmes.....	29
Part C: Conclusions	31
I. Features of Good Practice	31
II. Areas of Weakness	31
III. Recommendations for Follow-up Actions	32
IV. Summary & Overall Assessment	33

PART A: BACKGROUND AND CONTEXT OF THE REVIEW

I. The External Evaluation & Accreditation Panel

The Panel responsible for the Accreditation Review of the Undergraduate Study Programme (Integrated Master) of **Civil Engineering** of the **National Technical University of Athens** comprised the following four (4) members, drawn from the HAHE Register, in accordance with Laws 4009/2011 & 4653/2020:

- 1. Professor Theodore Stathopoulos (Chair)**
Concordia University, Canada

- 2. Professor Emeritus, Dimitirios Kolymbas**
Universität Innsbruck, Austria

- 3. Professor Panagiotis Scarlatos**
Florida Atlantic University, USA

- 4. Professor Nikiforos Stamatiadis**
University of Kentucky, USA

II. Review Procedure and Documentation

The External Evaluation and Accreditation Panel (EEAP) met for the first time on March 1, 2021, following the first official meeting of the EEAP for the training session of the HAHE, in order to provide the required introductions of the team members and discuss the approach for the visit, the roles of the Panel members, and the process to be followed. The chair identified a series of documents to be reviewed prior to the site visit and the members agreed to complete their review before the first meeting on Tuesday, March 2.

The onsite visit was conducted via online conference meetings due to COVID-19 travel restrictions. The visit started on March 2 and lasted until March 3, 2021. The Panel wrote the report in the following days (March 4 - 6) through collaborative meetings held also online.

The EEAP met initially the Dean of the School of Civil Engineering and the Vice Rector of the National Technical University of Athens (NTUA) and some initial presentations of the university and the School took place. The next session involved members of the faculty charged with the accreditation efforts (OMEA) including those at the university level (MODIP) and a discussion ensued to address some of the EEAP questions resulting from the documents that the EEAP had already reviewed. A detailed presentation of the various activities of the School regarding the study program with its updates and recent revisions, faculty and staff, student body, and research activities was provided to EEAP. This was followed by a session with current students in the program where their opinion was sought on several issues relative to the program, their experiences and concerns, as well as course loads and course evaluations. Six (6) students (all in their 9th semester) attended the session.

The second day (March 3) started with an on-line tour of classrooms, lecture halls, laboratories and other facilities with the Dean of the School of Civil Engineering and other faculty members including the heads of the various laboratories, participating in the “tour”. This occurred through a pre-recorded video. A review and discussion about the current facilities took place then. The next meeting was with recent and non-recent graduates of the program in order to gauge their experience and identify how well their studies are serving them in their current work environment. Nine (9) participants attended the session and provided valuable input regarding their experience of studying and their subsequent career paths. The next session of the day involved employers and partners of the program aiming to address the readiness of the graduates for the market as well as identify areas of cooperation between the department and employers.

The day closed with two meetings; one with OMEA and MODIP representatives to address any lingering questions and another with the Dean and Vice Rector along with the OMEA and MODIP members where additional questions were addressed, and a quick summary of the visit was discussed along with some key findings.

Overall, the faculty and staff had prepared a comprehensive and rigorous visit program with well-organized presentations and exchanges. All were open to discussion, eager to answer questions and show us both the strengths and the weaknesses of the programs. The EEAP was impressed by the exemplary level of cooperation with all members of the School of Civil Engineering. The EEAP was especially impressed with the students and previous graduates, their attendance, sincere views, collaboration and interest of the EEAP review.

A series of reports and other documents were provided to the EEAP prior and during the visit. The main documents that were used included the Internal Evaluation that the School developed recently, the External Evaluation completed in November 2013, the Curriculum Guide and course syllabi, the evaluation metrics and goals for the future, and all operational guides of the School. In addition, all PowerPoint presentations were provided with additional documents that demonstrated educational components for most sectors within the School.

It is apparent that the online discussion and meetings worked well and allowed for the completion of the EEAP program in a succinct manner. Clearly however, the lack of any social interactions during the visit is detrimental to the overall approach, since the said interactions provide more insight on the various aspects of the program and allow for additional, oftentimes informal, feedback and discussions. If this process continues in the future, it may be desirable to spread the meetings over a longer period of time, since typically in-person onsite visits last three full days.

III. Study Programme Profile

The School of Civil Engineering has been the oldest engineering school in Greece. Its academic research and educational programs have an excellent international reputation and contribute to the scientific, technical and economic development of the country. Since the 19th century, the graduates of this 5-year Diploma program are recognized as having a superb educational background combined with a critical engineering thinking. Currently, students are required to complete a total of 55 courses (40 required and 15 electives) along with the completion of the Diploma Thesis and Practical Training (optional). The program has an equivalency of 300 to 307 ECTS and the Practical Training credits could be included as an elective course. Students can identify one concentration area (sector) in which they select their elective courses and then complete their thesis on similar thematic areas. The School has developed a fairly detailed Curriculum Guide to ensure that students understand the program and how to plan their courses for completing their degree. In addition, course syllabi are available for all courses taught in the web page of the School. Students are given the opportunity to evaluate the courses they attend, and their input is considered in adjusting course content and delivery aspects.

Graduates of the program obtain the title of Civil Engineer and they can become members of the Technical Chamber of Greece (TEE). Graduates can be employed in both the private and public sector and most of the graduates have been successfully placed in both sectors after their graduation. There is also a large number of graduates who continue with post graduate studies and follow an academic career. Throughout the academic year, seminars are held with professionals working in the field that provide additional information and exposure to market options and work environment. The Practical Training also provides graduates with an opportunity to explore job prospects, gain valuable work experience and make contacts.

There are 47 faculty members that support the educational and research activities of the program and all have doctoral degrees from institutions abroad or from Greece. An issue of impending concern is the ability to replace those that are going to retire in the near future and ensure continuity of the program. The School was evaluated in 2013 through an External Evaluation Committee (EEC) and several of the recommendations of the report have been addressed. The School follows the required procedure for establishing quantitative metrics that define their progress as well as target goals to be achieved in the near future.

Based on data for the 2015-2019 period, there have been approximately 44 registered (out of which 24 active, i.e., registered within n+2 years) undergraduate students per faculty per year. For the same period, there is a ratio of 5 doctoral students per faculty. The infrastructure for delivering the program (classrooms, laboratories, libraries, etc.) are adequate and well equipped. However, the workload of the faculty members appears to be high.

PART B: COMPLIANCE WITH THE PRINCIPLES

Principle 1: Academic Unit Policy for Quality Assurance

INSTITUTIONS SHOULD APPLY A QUALITY ASSURANCE POLICY AS PART OF THEIR STRATEGIC MANAGEMENT. THIS POLICY SHOULD EXPAND AND BE AIMED (WITH THE COLLABORATION OF EXTERNAL STAKEHOLDERS) AT ALL INSTITUTION'S AREAS OF ACTIVITY, AND PARTICULARLY AT THE FULFILMENT OF QUALITY REQUIREMENTS OF UNDERGRADUATE PROGRAMMES. THIS POLICY SHOULD BE PUBLISHED AND IMPLEMENTED BY ALL STAKEHOLDERS.

The quality assurance policy of the academic unit is in line with the Institutional policy on quality, and is included in a published statement that is implemented by all stakeholders. It focuses on the achievement of special objectives related to the quality assurance of study programmes offered by the academic unit.

The quality policy statement of the academic unit includes its commitment to implement a quality policy that will promote the academic profile and orientation of the programme, its purpose and field of study; it will realise the programme's strategic goals and it will determine the means and ways for attaining them; it will implement the appropriate quality procedures, aiming at the programme's continuous improvement.

In particular, in order to carry out this policy, the academic unit commits itself to put into practice quality procedures that will demonstrate:

- a) the suitability of the structure and organization of the curriculum;*
- b) the pursuit of learning outcomes and qualifications in accordance with the European and the National Qualifications Framework for Higher Education;*
- c) the promotion of the quality and effectiveness of teaching;*
- d) the appropriateness of the qualifications of the teaching staff;*
- e) the enhancement of the quality and quantity of the research output among faculty members of the academic unit;*
- f) ways for linking teaching and research;*
- g) the level of demand for qualifications acquired by graduates, in the labour market;*
- h) the quality of support services such as the administrative services, the Library, and the student welfare office;*
- i) the conduct of an annual review and an internal audit of the quality assurance system of the undergraduate programme(s) offered, as well as the collaboration of the Internal Evaluation Group (IEG) with the Institution's Quality Assurance Unit (QAU).*

Study Programme Compliance

The School has established a Quality Assurance Policy for the undergraduate program that is commensurate to the program and includes a commitment that satisfies the requirements and ensures a continuous improvement process. The School has set up a committee consisting of faculty members that meet periodically to discuss the goals of the quality assurance, identify areas of improvement and establish a set of actions to be undertaken to achieve these goals. The committee follows the overall University guidance for ensuring the quality of the program and works closely with the university representatives to ensure compliance.

There is a culture of continuous improvement of the quality of the program as demonstrated through the various interactions of the EEAP with the faculty, staff, students and graduates of the program. As an example, students are required to complete a course evaluation towards the end of the semester that forms a feedback loop for the faculty to not only address course content and outcome goals but teaching methods as well. Unfortunately, however, the participation rate is low. Students seemed to be unsure whether their input were taken seriously into account and they also complained about the length, relevance and effectiveness of this questionnaire.

The School believes that the Quality Assurance Policy guarantees an undergraduate program that balances knowledge and skills and addresses the learning outcomes of the program. In addition, the School strives to provide a study program that reflects current educational and professional trends, promotes incorporation of research advancements in classroom teaching, and aims to develop technically qualified graduates that can be employable. It should be noted though that the continuously reducing number of faculty members and the uncertainty regarding their replacement may be problematic especially in order to satisfy program needs. The School is also committed to an internal evaluation of the study program to ensure that it reflects current knowledge and market trends. At the same time, a review of the Quality Assurance process has been undertaken to ensure compliance with national and university policies.

The School has reviewed the quality metrics developed by HAHE and the University and has identified those that are reflective of their program to guide their actions and strategic planning. These metrics are compiled annually. The metrics used include values for teaching quality, improved research communication, improved departmental operational procedures, increased interactions with the community, and enhanced promotion of market opportunities to students. The values of these goals are reviewed and adjusted accordingly to ensure that the program continuously improves. The goals defined in the Internal Evaluation of the School are paired with several of the quality metrics that are used and monitored and there is an adequate coverage for tracking progress and achievement of goals. The committee that is set up to ensure the quality of the process and program is also charged with reviewing the progress in achieving the goals of the metrics and monitoring adjustments aiming to address this progress.

The School communicates the Internal Evaluation and the processes for the Quality Assurance in their web page and is available for all to review.

Panel Judgement

Principle 1: Institution Policy for Quality Assurance	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

It is apparent that the process that has been developed and set up is appropriate for ensuring compliance with the principle.

Principle 2: Design and Approval of Programmes

INSTITUTIONS SHOULD DEVELOP THEIR UNDERGRADUATE PROGRAMMES FOLLOWING A DEFINED WRITTEN PROCESS WHICH WILL INVOLVE THE PARTICIPANTS, INFORMATION SOURCES AND THE APPROVAL COMMITTEES FOR THE PROGRAMME. THE OBJECTIVES, THE EXPECTED LEARNING OUTCOMES, THE INTENDED PROFESSIONAL QUALIFICATIONS AND THE WAYS TO ACHIEVE THEM ARE SET OUT IN THE PROGRAMME DESIGN. THE ABOVE DETAILS AS WELL AS INFORMATION ON THE PROGRAMME'S STRUCTURE ARE PUBLISHED IN THE STUDENT GUIDE.

Academic units develop their programmes following a well-defined procedure. The academic profile and orientation of the programme, the objectives, the subject areas, the structure and organisation, the expected learning outcomes and the intended professional qualifications according to the National Qualifications Framework for Higher Education are described at this stage. The approval or revision process for programmes includes a check of compliance with the basic requirements described in the Standards, on behalf of the Institution's Quality Assurance Unit (QAU).

Furthermore, the programme design should take into consideration the following:

- *the Institutional strategy*
- *the active participation of students*
- *the experience of external stakeholders from the labour market*
- *the smooth progression of students throughout the stages of the programme*
- *the anticipated student workload according to the European Credit Transfer and Accumulation System*
- *the option to provide work experience to the students*
- *the linking of teaching and research*
- *the relevant regulatory framework and the official procedure for the approval of the programme by the Institution*

Study Programme Compliance

The EEC was impressed by the careful planning and excellent composition of the program, which requires for Engineering a difficult balance between a sound theoretical background and a good mastering of applied practice. The School achieved a very good mix in this respect. As for the theoretical background, it is the key for the versatility and the successful handling of later tasks in new areas of technology. This is particularly important in our time of rapid changes of technologies and methods. The graduates and the stakeholders have unanimously praised the fact that the School offers a very good instruction and training in the theoretical background. In doing so, the teaching of practical procedures is carried out adequately. This is underlined by the excellent laboratory equipment. The involvement of the students in many national and international research programs noticeably increases their qualification, which is also witnessed by their good acceptance abroad. This is also enhanced by the pronounced dedication of the teaching staff to providing good support to the students.

The procedures for the design of the program appear adequate in terms of transparency, general acceptance and consideration of the many and varied goals. The workload of students is considerable, but it meets today's requirements. The students are well informed about the courses offered, their content, the form of presentation and the examination and they also receive good learning materials. Their progression could be somehow facilitated if the students complied with the required sequence of the individual subjects and respect the prerequisites.

As for work experience in practice, the students are offered the possibility of Practical Training lasting two months, a possibility that is used by some of them. Unfortunately, for insurance reasons, they are not given access to construction sites and can only do office work. This fact and also the note of stakeholders that a period of two months is too short for them to obtain an adequate instruction makes the usefulness of this activity questionable. It should be mentioned here that the Bologna Agreement, which is valid throughout Europe, pushes for a speedy completion of studies and hardly allows for longer internships. Even the students' excursions to construction sites have been considerably reduced throughout Europe.

Notwithstanding the today's excellent range of courses, one should also think about the future. The interview with stakeholders was particularly revealing. Clearly, their majority pushes for more practical training and underestimates the above-mentioned value of theoretical foundations. On the other hand, they point to the declining importance of civil engineers, which goes hand in hand with the improvement of a country's infrastructure. In this respect, they call for improved management training (project management, contracting, as well as new developments such as maintenance and refurbishing, smart cities and the like) and also towards more extroversion in view of the increasing work opportunities abroad. In this respect, increased international exchange of students and teaching staff as well as lectures given in English would help. They also point to the importance of good technical writing for concise presentation of their own ideas.

Panel Judgement

Principle 2: Design and Approval of Programme	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

The External Evaluation & Accreditation Panel agrees that this Programme leads to a Level 7 Qualification according to the National & European Qualifications Network (Integrated Master)	YES	NO*
	X	

Panel Recommendations

Overall, the School has developed an appropriate study program for the student body, and it is reflected in the qualities of its graduates. There are a few aspects that the School may want to consider in order to further improve the quality of the program and market attractiveness of its graduates.

The first aspect deals with the implementation of the course prerequisites. It may be desirable in the near future to develop a policy that would enforce more the need of completing course

prerequisites, since they often provide meaningful background for more advanced courses. The current effort of limiting the number of courses a student could register for in a semester is a good approach and it should be monitored to determine whether it could be adjusted downward.

The second aspect deals with the need of aligning course content with current market trends to address the everchanging professional needs of civil engineers. The stakeholders emphasized the need to include elements in the program that would address the need for infrastructure repairs and retrofits that are not currently covered in the program. This would also reflect the fact that current civil engineers are not tasked with the creation of large infrastructure projects but rather maintaining and updating current ones.

A third aspect deals with the establishment of an External Advisory Board that could work with the School to identify market trends in order to incorporate them in the curriculum and produce highly employable graduates.

Principle 3: Student- centred Learning, Teaching and Assessment

INSTITUTIONS SHOULD ENSURE THAT THE UNDERGRADUATE PROGRAMMES ARE DELIVERED IN A WAY THAT ENCOURAGES STUDENTS TO TAKE AN ACTIVE ROLE IN CREATING THE LEARNING PROCESS. THE ASSESSMENT METHODS SHOULD REFLECT THIS APPROACH.

Student-centred learning and teaching plays an important role in stimulating students' motivation, self-reflection and engagement in the learning process. The above entail continuous consideration of the programme's delivery and the assessment of the related outcomes.

The student-centred learning and teaching process

- *respects and attends to the diversity of students and their needs, enabling flexible learning paths;*
- *considers and uses different modes of delivery, where appropriate;*
- *flexibly uses a variety of pedagogical methods;*
- *regularly evaluates and adjusts the modes of delivery and pedagogical methods aiming at improvement;*
- *regularly evaluates the quality and effectiveness of teaching, as documented especially through student surveys;*
- *reinforces the student's sense of autonomy, while ensuring adequate guidance and support from the teaching staff;*
- *promotes mutual respect in the student - teacher relationship;*
- *applies appropriate procedures for dealing with students' complaints.*

In addition :

- *the academic staff are familiar with the existing examination system and methods and are supported in developing their own skills in this field;*
- *the assessment criteria and methods are published in advance;*
- *the assessment allows students to demonstrate the extent to which the intended learning outcomes have been achieved. Students are given feedback, which, if necessary is linked to advice on the learning process;*
- *student assessment is conducted by more than one examiner, where possible;*
- *the regulations for assessment take into account mitigating circumstances;*
- *assessment is consistent, fairly applied to all students and carried out in accordance with the stated procedures;*
- *a formal procedure for student appeals is in place.*

Study Programme Compliance

A student-centered approach in terms of teaching is manifested through the ability of the students to select a concentration area to focus their studies selecting an aspect of the discipline they are most interested in. The course content is delivered through lectures, lab sessions, and electronic delivery (especially in the current period of the pandemic). The role of Academic Advisor appears to be underutilized by the students.

Student course evaluation surveys to measure the effectiveness of teaching are conducted at the end of each semester. This survey is conducted for the entire University and it can be onerous depending on the number of instructors for the course (if more than one is involved, then the students need to complete multiple surveys). A recent effort spearheaded from the

School has been implemented targeting input specific for the Civil Engineering faculty and program.

Student assessment is carried out according to the program's regulations, which are consistently and fairly applied to all students. Exams are conducted based on the schedule posted by the School and they are typically written. However, exam mode can be adapted (e.g., become oral rather than written if the number of students allows it) in response to the assessment methods and components. Feedback on exams could be provided to those desiring to do so. Grade components and assessment methods are published in advance and are available in the course syllabi. Recent exams that were conducted electronically due to COVID have been successful and the School has tried several approaches to ensure proctoring of the exams and reduction of possibilities to cheat.

Student appeals and complaints can be lodged in a number of ways: addressed to the relevant faculty and less frequently they could be addressed (verbally or in writing) to the School Dean or discussed informally with the Academic Adviser. There is a new Committee of Student Affairs to which a student could seek advice for any program issue.

The students interviewed expressed a satisfaction of the knowledge they received, and they also noted an understanding of the high faculty workload alluding to long time it takes for grading exams. In general, they appeared appreciative of the teaching staff. However, they expressed a frustration with the course evaluations, since they viewed them as ineffective due to lack of transparency and demonstration of how faculty uses the results to improve course content and delivery methods. The length of the evaluations was also mentioned as a prohibitive factor for completing the surveys. Finally, the students expressed a desire of restructuring the electives in order to allow for a greater ability to select among the current courses offered. The current distribution of electives is deemed fairly restrictive, and it may require a review of offerings among the various thematic units, i.e., allow for more options among the units.

The School is using the mycourses website that provides all relevant course material. It is an efficient means to inform students of course -related items, e.g., changes, due dates for exams and assignments. All courses utilize this platform.

The School offers participation in Practical Training as an elective course. This is an option that only a small number of students elect (approximately 50 per year) and this is due to the reduced available funds to cover the students' labour and the lack of positions available in the industry. A capstone course has been also recently introduced (approximately three years ago), after the recommendation of the EEC in 2013, that aims to address teamwork and comprehensive use of accumulated knowledge from previous years within the sector the course is offered.

Panel Judgement

Principle 3: Student- centred Learning, Teaching and Assessment	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

In general, the School has implemented a student-centered learning and teaching, that is reflected on the course profiles and syllabi and the acceptance from the students. There are five issues that may require future attention.

The first deals with the lack of a systematic effort to develop technical oral and writing skills; this could be identified in the learning objectives of the courses. There is a need to develop the students' technical oral and writing skills and possibly consider such skills across the curriculum to emphasize their importance and allow for a gradual introduction in several courses.

The second issue deals with the Practical Training. There is a need for greater participation of students in this effort and possibly increased efforts from the faculty to promote this concept. The length of the training should be reconsidered (industry expressed a desire for a 6-month training) as well as the method of partnering students with industry.

The third issue addresses the capstone course as it is currently delivered. Frequently, such courses are developed to allow for students to have an interdisciplinary appreciation of the civil engineering profession and thus they involve projects addressing all concentrations of the profession. A revision of the content of the course could be beneficial in order to allow for a greater appreciation of the various civil engineering subdisciplines and provide students with a more global perspective of their future work environment.

A fourth aspect deals with the course evaluations that require a review to ensure that appropriate and useful data are collected. The School has developed its own survey to target specific programmatic questions, and this is commendable. However, the fact the School is required to conduct the NTUA course evaluations as well may result in duplicitous efforts and lower participation rates. In addition, the students do not see how their input is considered and affects course delivery and summarizing such adjustments and improvement efforts should be more transparent and presented/advertised to the student body. Efforts to increase participation in these evaluations could include completing them during lectures, reducing the number of questions, establishing an exit interview, and offering a lottery prize for those participating.

Another point to consider is the increase in offering courses in English. Even though this could be viewed as an affront to Greek language, the need to attract a larger international student body may offset this. These efforts could be initiated in higher level courses and expanded as needed.

Principle 4: Student Admission, Progression, Recognition and Certification

INSTITUTIONS SHOULD DEVELOP AND APPLY PUBLISHED REGULATIONS COVERING ALL ASPECTS AND PHASES OF STUDIES (ADMISSION, PROGRESSION, RECOGNITION AND CERTIFICATION).

Institutions and academic units need to put in place both processes and tools to collect, manage and act on information regarding student progression.

Procedures concerning the award and recognition of higher education degrees, the duration of studies, rules ensuring students progression, terms and conditions for student mobility should be based on the institutional study regulations. Appropriate recognition procedures rely on institutional practice for recognition of credits among various European academic departments and Institutions, in line with the principles of the Lisbon Recognition Convention.

Graduation represents the culmination of the students' study period. Students need to receive documentation explaining the qualification gained, including achieved learning outcomes and the context, level, content and status of the studies that were pursued and successfully completed (Diploma Supplement).

Study Programme Compliance

The Civil Engineering Integrated Master Program at NTUA maintains an effective system to properly manage, coordinate and act on student admission, progression, recognition and certification.

The newly admitted students are provided with lot of information pertaining to their studies and the overall academic life. After their admission to the program, they receive a welcome message from the Dean along with useful information. During the first month they attend a social gathering where they meet the Dean, the Chairs, faculty members and fellow students and they get informed about extra-curriculum activities such as athletics, musical and dancing student clubs, student organizations, etc.

The students appear to receive appropriate academic advice. All of the academic and other data are readily available to the students at the School's web site.

Depending on the course specifics, the student progress is continuously monitored through written and oral exams, successful completion of laboratory and practical projects, and presentations of individual or teamwork assignments. In addition, the capstone project class and the Diploma Thesis are good indicators of the academic maturity attained by the students.

Students' mobility is encouraged. There is a very limited number of available domestic scholarships as well as the ERASMUS, IAESTE and BEST programs for the European Union. During their interview, students indicated that getting a scholarship is not an easy task.

Mobility is facilitated with the adaptation of the ECTS credit system. Thus, coursework from other EU Universities is easily transferable through MoUs or the Diploma Supplement. The Diploma Supplement is issued to all program graduates.

The requirements for the Diploma Thesis are well-defined and the evaluation is based on:

- Completeness of literature review

- Data collection from: laboratory experiments; field observations; theoretical analysis; computer simulations; literature compilation
- Analysis and/or synthesis of data and conclusions derivation
- Compliance with proper scientific/technical writing format and terminology
- Initiative taking and working ethos of the student, and
- Clarity of oral presentation.

All of the Thesis requirements and guidelines are posted on the School's website. On the overall, the quality of the Diploma Theses is commendable since many theses generate papers for peer-reviewed journals.

The School has a continuously updating database of private businesses and public entities that accept students for Practical Training, which is a 2-month endeavour that gives the students an opportunity to gain knowledge of real-life engineering work. The evaluation of this course is done through a report that the student submits upon completion of the training.

Panel Judgement

Principle 4: Student Admission, Progression, Recognition and Certification	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

The EEAP concluded that the School delivers all of the individual aspects for ensuring student admission and completion of studies in a very satisfactorily and professional manner. The only concern is with the role of the Student Advisor who currently seems to be underutilized. Placing a greater emphasis on the advisory role of faculty for mentoring students could benefit completion rates and possibly assist in addressing the issues with prerequisites discussed in Principle 2.

Principle 5: Teaching Staff

INSTITUTIONS SHOULD ASSURE THEMSELVES OF THE QUALIFICATIONS AND COMPETENCE OF THE TEACHING STAFF. THEY SHOULD APPLY FAIR AND TRANSPARENT PROCESSES FOR THE RECRUITMENT AND DEVELOPMENT OF THE TEACHING STAFF.

The Institutions and their academic units have a major responsibility as to the standard of their teaching staff providing them with a supportive environment that promotes the advancement of their scientific work. In particular, the academic unit should:

- *set up and follow clear, transparent and fair processes for the recruitment of properly qualified staff and offer them conditions of employment that recognize the importance of teaching and research;*
- *offer opportunities and promote the professional development of the teaching staff;*
- *encourage scholarly activity to strengthen the link between education and research;*
- *encourage innovation in teaching methods and the use of new technologies;*
- *promote the increase of the volume and quality of the research output within the academic unit;*
- *follow quality assurance processes for all staff members (with respect to attendance requirements, performance, self-assessment, training etc.);*
- *develop policies to attract highly qualified academic staff.*

Study Programme Compliance

The School has 47 full time faculty members that collectively provide the multidisciplinary requirements to cover civil engineering teaching and research. In addition, there are 35 staff members who are supporting the teaching and laboratory activities of the School. All faculty and staff members are actively involved in research that supports and complements the delivery of the study program and teaching of the courses. The School also encourages faculty to relate and translate their research activities into their courses. The publication track record of the faculty and staff is excellent and confirms the strong research profile and activities of the School.

The School follows a clear, transparent and fair recruitment processes as dictated by law resulting in hiring of properly qualified staff. The School has recently established a committee to develop a strategic plan on future directions and hiring of faculty. This could be imperative given the impending retirements in the near future.

Innovation in teaching is encouraged by promoting the use of e-learning platforms, laboratory-based exercises, and use of greater project-based learning efforts.

The typical average annual load is approximately 5 courses, which is high and causes an impediment to the enhancement of their research activities. Furthermore, due to the anticipated departure of a significant number of faculty members, teaching loads may become prohibitive. This is a great concern of the EEAP.

There are several courses (not sections of the same course) that are taught by multiple instructors, and this may be detrimental to the course delivery and cohesion.

The School's academic staff are very research active, having published approximately 50 peer reviewed journal papers per year in the previous 4 years per faculty. There is also a strong presence of the academic staff in conferences with a larger average number (approximately 80 per year per faculty). Frequently, the Diploma Thesis also serves as a springboard for research activities.

Opportunities for professional development are offered through funding for conference attendance, and mobility for teaching or research on the basis of existing university-level bilateral agreements (e.g., ERASMUS). The current (and anticipated future) funding from NTUA and the government does not encourage activities relevant to international mobility.

Academic staff members are subject to the quality assurance processes of MODIP, including the assessment of their teaching by students at the end of each semester. However, the EEAP was informed during the discussions with current students of the program that they have the impression that these evaluations are not utilized.

Panel Judgement

Principle 5: Teaching Staff	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

The School has an excellent faculty and staff body with a strong research track record. Actively pursuing the replacement of faculty retirements to ensure the continuity of the program delivery at the high standards that they have been performing thus far is an immediate and critical priority. The EEAP is pleased with the establishment of the committee to develop a strategic plan for upcoming hires (as recommended by the EEC in 2013), and it emphasizes the urgency with which this needs to be accomplished. The School should continue to evaluate new hires through its strategic plan to address research priorities and focus areas for the future so it will be well-positioned to address upcoming changes in the profession.

The EEAP suggests the establishment of a Centre for Teaching and Learning that could help professional development of primarily (but not exclusively) junior faculty and provide them with seminars on lecture delivery, exam content development, and other teaching skills, teaching methods, etc. Such a centre could engage educational consultants from inside or outside NTUA. Moreover, the EEAP suggests the continuous development and encouragement of professional development of academic staff.

An issue of concern with the EEAP is the use of multiple instructors for the same section of a course. This is considered as detrimental to the overall course delivery and cohesion and it should be revisited to determine its value.

Principle 6: Learning Resources and Student Support

INSTITUTIONS SHOULD HAVE ADEQUATE FUNDING TO COVER TEACHING AND LEARNING NEEDS. THEY SHOULD –ON THE ONE HAND- PROVIDE SATISFACTORY INFRASTRUCTURE AND SERVICES FOR LEARNING AND STUDENT SUPPORT AND–ON THE OTHER HAND- FACILITATE DIRECT ACCESS TO THEM BY ESTABLISHING INTERNAL RULES TO THIS END (E.G. LECTURE ROOMS, LABORATORIES, LIBRARIES, NETWORKS, BOARDING, CAREER AND SOCIAL POLICY SERVICES ETC.).

Institutions and their academic units must have sufficient funding and means to support learning and academic activity in general, so that they can offer to students the best possible level of studies. The above means could include facilities such as libraries, study rooms, educational and scientific equipment, information and communications services, support or counselling services.

When allocating the available resources, the needs of all students must be taken into consideration (e.g. whether they are full-time or part-time students, employed or international students, students with disabilities) and the shift towards student-centred learning and the adoption of flexible modes of learning and teaching. Support activities and facilities may be organised in various ways, depending on the institutional context. However, the internal quality assurance ensures that all resources are appropriate, adequate, and accessible, and that students are informed about the services available to them.

In delivering support services the role of support and administrative staff is crucial and therefore they need to be qualified and have opportunities to develop their competences.

Study Programme Compliance

The School has a very satisfactory infrastructure to support adequately its academic mission, including both teaching and research. The School maintains 15 specialty labs and some of which are nationally/internationally certified.

In addition, there are fully equipped classrooms and amphitheatres, library, teleconferencing and e-Learning facilities. Most areas are accessible by students with disabilities. It appears that overall, the facilities are distributed rationally.

There is a variety of support services available to the students and they are all listed on the School's web site. Students are also informed about those services during their first semester.

The student can find support on a variety of issues from their Academic Advisor, the Committee on Study Matters, IT Services, Central Library, ERASMUS Office, and Services of Student Welfare.

All of the above services and facilities are supported by 46 administrative employees the number of whom are always decreasing by attrition.

Panel Judgement

Principle 6: Learning Resources and Student Support	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

The EEAP was satisfied from the existing facilities and their quality. Students in the Department are provided with an excellent spectrum of educational, social, and recreational services. It should be noted though that required maintenance and upkeep is essential for the continued progress and support of the students.

The EEAP also considers that the current structure of the laboratories covers adequately the program needs but the ensuing retirements may require consolidation of the laboratories. In addition, the replacement of physical laboratories with virtual ones should be also part of future plans.

Principle 7: Information Management

INSTITUTIONS BEAR FULL RESPONSIBILITY FOR COLLECTING, ANALYSING AND USING INFORMATION, AIMED AT THE EFFICIENT MANAGEMENT OF UNDERGRADUATE PROGRAMMES OF STUDY AND RELATED ACTIVITIES, IN AN INTEGRATED, EFFECTIVE AND EASILY ACCESSIBLE WAY.

Institutions are expected to establish and operate an information system for the management and monitoring of data concerning students, teaching staff, course structure and organisation, teaching and provision of services to students as well as to the academic community.

Reliable data is essential for accurate information and for decision making, as well as for identifying areas of smooth operation and areas for improvement. Effective procedures for collecting and analysing information on study programmes and other activities feed data into the internal system of quality assurance.

The information gathered depends, to some extent, on the type and mission of the Institution. The following are of interest:

- *key performance indicators*
- *student population profile*
- *student progression, success and drop-out rates*
- *student satisfaction with their programme(s)*
- *availability of learning resources and student support*
- *career paths of graduates*

A number of methods may be used for collecting information. It is important that students and staff are involved in providing and analyzing information and planning follow-up activities.

Study Programme Compliance

The School has an advanced, diverse and flexible system of information management. Online course delivery is widely offered. Modern and efficient platforms are used that enable the lecturers to deliver their courses efficiently. Adequate infrastructure exists to conduct and evaluate surveys of student satisfaction and course evaluations. The students have electronic access to learning resources and their grades. The support of these computer applications seems to work efficiently while maintaining the privacy of personal data.

Panel Judgement

Principle 7: Information Management	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

The School performs well and has established the appropriate procedures to collect the required data for their evaluations based on the data provided.

Principle 8: Public Information

INSTITUTIONS SHOULD PUBLISH INFORMATION ABOUT THEIR TEACHING AND ACADEMIC ACTIVITIES WHICH IS CLEAR, ACCURATE, OBJECTIVE, UP-TO-DATE AND READILY ACCESSIBLE.

Information on Institution's activities is useful for prospective and current students, graduates, other stakeholders and the public.

Therefore, institutions and their academic units provide information about their activities, including the programmes they offer, the intended learning outcomes, the qualifications awarded, the teaching, learning and assessment procedures used, the pass rates and the learning opportunities available to their students, as well as graduate employment information.

Study Programme Compliance

The central website of the School is very informative, and it contains extensive information in seven categories: Information, News, Departments, Laboratories, Personnel, Administration and Curriculum.

- "Information" includes a wide variety of general subjects related to the Civil Engineering program.
- "News" lists all of the Schools current announcements before they are archived.
- "Departments" provides information about the activities and personnel in each area of specialization; the same stands for the "Laboratories".
- "Personnel" includes information on all of the School's teaching and support personnel.
- "Administration" introduces the administrative personnel: Dean, Senate, Department Chairs.
- "Curriculum" describes in detail the courses offered, the programs structure, the expected learning outcomes, and the instruction and assessment procedures used.

The website is frequently updated by the School's Secretarial and IT personnel.

All courses are adequately described and generally easily accessible in Greek and English. However, in general the website appears to be more detailed in Greek than in English.

Panel Judgement

Principle 8: Public Information	
Fully compliant	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

The webpage of the School is well organized, and it provides the appropriate information to the public and students. The EEAP though recommends a thorough review both of the content and language of the various webpages to ensure that those seeking information could reach them easily and improve webpage navigation. Short descriptions for each research effort would be beneficial and informative in order to entice information-seekers and provide them with relevant information.

Principle 9: On-going Monitoring and Periodic Internal Review of Programmes

INSTITUTIONS SHOULD HAVE IN PLACE AN INTERNAL QUALITY ASSURANCE SYSTEM FOR THE AUDIT AND ANNUAL INTERNAL REVIEW OF THEIR PROGRAMMES, SO AS TO ACHIEVE THE OBJECTIVES SET FOR THEM, THROUGH MONITORING AND AMENDMENTS, WITH A VIEW TO CONTINUOUS IMPROVEMENT. ANY ACTIONS TAKEN IN THE ABOVE CONTEXT SHOULD BE COMMUNICATED TO ALL PARTIES CONCERNED.

Regular monitoring, review and revision of study programmes aim to maintain the level of educational provision and to create a supportive and effective learning environment for students.

The above comprise the evaluation of:

- the content of the programme in the light of the latest research in the given discipline, thus ensuring that the programme is up to date;*
- the changing needs of society;*
- the students' workload, progression and completion;*
- the effectiveness of the procedures for the assessment of students;*
- the students' expectations, needs and satisfaction in relation to the programme;*
- the learning environment, support services and their fitness for purpose for the programme*

Programmes are reviewed and revised regularly involving students and other stakeholders. The information collected is analysed and the programme is adapted to ensure that it is up-to-date. Revised programme specifications are published.

Study Programme Compliance

The School applies a good policy for the design, regular revision and adaptation of their programs. The HAHE's expectation that the internal review of the programs with respect to the changing needs of society, latest research etc. be *annual* may not be easily implemented.

As regards the student's expectations, needs and satisfaction in relation to the program, the School applies considerable efforts. Their feedback is monitored with regular questionnaires. However, the response to these questionnaires is limited and should be improved. The EEAP tried to identify the reasons in the interview with students. Several reasons were identified including too many questionnaires, too many questions (some of them not applicable to particular cases) and the feeling that their response to the questions is not taken into account, could be some of them.

Panel Judgement

Principle 9: On-going Monitoring and Periodic Internal Review of Programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

The EEAP is satisfied with the process the School follows in this regard. It should be noted that this Principle is inherently connected with Principles 1 and 2 and comments noted there apply here as well.

Course evaluation surveys could be improved as noted in Principle 3.

Principle 10: Regular External Evaluation of Undergraduate Programmes

PROGRAMMES SHOULD REGULARLY UNDERGO EVALUATION BY COMMITTEES OF EXTERNAL EXPERTS SET BY HAHE, AIMING AT ACCREDITATION. THE TERM OF VALIDITY OF THE ACCREDITATION IS DETERMINED BY HAHE.

HAHE is responsible for administrating the programme accreditation process which is realised as an external evaluation procedure, and implemented by a committee of independent experts. HAHE grants accreditation of programmes, with a specific term of validity, following to which revision is required. The accreditation of the quality of the programmes acts as a means of verification of the compliance of the programme with the template's requirements, and as a catalyst for improvement, while opening new perspectives towards the international standing of the awarded degrees.

Both academic units and institutions participate in the regular external quality assurance process, while respecting the requirements of the legislative framework in which they operate.

The quality assurance, in this case the accreditation, is an on-going process that does not end with the external feedback, or report or its follow-up process within the Institution. Therefore, Institutions and their academic units ensure that the progress made since the last external quality assurance activity is taken into consideration when preparing for the next one.

Study Programme Compliance

The program had an evaluation in 2013 and most of the recommendations have been implemented. It is presently being evaluated by the HAHE process.

The EEAP is pleased with the School's response to the last EEC report of November 2013. All of the recommendations have been considered and most have been implemented.

Members of the staff were aware of the importance of this review, all participated enthusiastically in the meetings and they seem to be interested in undertaking the necessary steps to implement the recommendations of the current evaluation.

Panel Judgement

Principle 10: Regular External Evaluation of Undergraduate Programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

The School is appropriately engaged in an evaluation process of their program and activities. Overall, the School's scope is achieved as the learning outcomes address the professional rights

of civil engineers. The EEAP believes that the evaluation process could be enhanced utilizing the following suggestions.

First, it would be imperative for the School to establish a strategic plan to address future needs and upcoming trends. This plan should identify future profession shifts, establish priorities for faculty hires to replace retirees, determine emerging programmatic areas, and develop plans for laboratory utilization.

Second, it would be beneficial to the School to also establish an External Advisory Board in order to engage and seek the input of employers and professional associations to ensure an updated view of the profession and develop graduates that are better prepared to enter the workforce. The Board would work with the School to provide feedback on educational and market aspects.

Third, it would be valuable to develop a survey of graduating students and graduates to obtain a program evaluation and identify potential areas of improvement. This would provide an opportunity to students to reflect on their knowledge gained and identify potential areas of changes.

PART C: CONCLUSIONS

I. Features of Good Practice

The School has demonstrated a series of good practices during the virtual onsite visit and documentation provided. These practices reflecting the major strengths of the program include:

- A study program that has been thoughtfully re-designed following the recommendations made by the previous external evaluation of 2013 in order to provide a strong core and significant technical options to students through the four specialization sectors within civil engineering
- A study program that promotes **critical thinking** in civil engineering resulting in extremely well-qualified graduates that industry and academia both nationally and internationally seek out for hiring
- A study program that commands prominence in the field of civil engineering not only nationally but internationally
- A faculty body that is dedicated to the teaching values and duties and take immense pride in their efforts to educate students and provide them with a first-class education despite their resource limitations
- A faculty body that is exemplary trained with significant research presence locally, nationally and internationally and high levels of productivity and recognition
- An infrastructure appropriate and adequate to provide the required teaching and research activities and support student activities
- A study program that undergoes evaluation and update in order to include current research findings and to address community and societal needs
- A faculty culture of continuous evaluation and improvement based on efforts observed during the onsite visit and prior evaluation documents, and
- A faculty body that works very closely with local and regional authorities and entities on various aspects of civil engineering and provides guidance and consultations through its laboratories and expertise.

II. Areas of Weakness

The School is also facing a number of issues that do not allow it to fully reach its capabilities.

These areas include:

- Anticipated retirements in the near future that could reduce the faculty by as many as 13 members with a very uncertain replacement timeframe.
- The lack of a strategic plan to guide the School through the future uncertainties and provide potential routes and actions to mitigate the consequences of possible resource inadequacies.
- Inability to have input on the number and selection criteria of transferred students from other educational institutions to NTUA. This could be rectified by developing a set of criteria as an input on the number and selection of transferred students from other educational institutions to NTUA.

III. Recommendations for Follow-up Actions

The EEAP is very pleased with the overall performance of the School and the qualifications of its faculty and staff to complete the required educational goals and research activities. All indicators point out to the national and international excellent reputation of the School and its academic program. The following suggestions could simply serve as tools and instruments for the continuous improvement and the fulfilment of the long-term goals of the School. Therefore, the EEAP proposes the following recommendations as follow-up actions for the School:

- Prioritize the immediate replacement of the faculty and technical support members who will leave their positions in the following 5 years considering the near- and long-term needs of the School.
- Intensify the ongoing development of a strategic plan to incorporate emerging high-value opportunities and unanticipated eventualities in the systematic development of the School's research and educational programs.
- Establish an **External Advisory Board** as a consultative body to the School with members from industry and other organizations (Stakeholders), who would advise the School regarding issues such as:
 - Development of the above-mentioned strategic plan;
 - Emerging areas of priority to incorporate in the curriculum;
 - Marketability and the continuous improvement of the graduates;
 - Optimization of resource allocation for the maintenance and further development of laboratories and facilities; and
 - Consideration of alternative testing procedures and computational simulation approaches.
- Consolidate the current activities to develop and enhance the teaching skills of primarily (but not exclusively) junior faculty members by establishing a **Centre for Teaching and Learning** fully dedicated to this objective.
- Attempt to minimize the number of professors responsible for teaching a single course (or section thereof) in order to establish a sense of ownership of teaching and learning responsibilities.
- Intensify the efforts to apply rigorously the prerequisite structure of the courses when students are registered for each course.
- Continue the update of program curriculum on an ongoing basis to emphasize the multidisciplinary character of Civil Engineering and to ensure inclusivity of the new innovative trends in the field.
- Reconsider the overall aspects of Practical Training focusing on the increase of duration and student participation.
- Increase emphasis in the development of communication skills throughout the curriculum and increase course offerings and other teaching activities in English.
- Continue the efforts to improve the course evaluation process and increase the student participation rates by considering simplification and better targeting of the questionnaires, establishing exit interviews, publishing their analysed results (to whatever extent can be allowed) and the like.
- Consider developing activities that could further promote the image of the School to Stakeholders with events such as the organization of an "Engineering Night".

- Establish systematic ongoing professional development and continuing education to at least all graduates of the School.
- Review both of the content and language of the various webpages to ease access to pertinent information.

IV. Summary & Overall Assessment

The Principles where full compliance has been achieved are: **1, 2, 3, 4, 5, 6, 7, 9, 10**

The Principles where substantial compliance has been achieved are: **8**

The Principles where partial compliance has been achieved are: **None**

The Principles where failure of compliance was identified are: **None**

Overall Judgement	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

The External Evaluation & Accreditation Panel agrees that this Programme leads to a Level 7 Qualification according to the National & European Qualifications Network (Integrated Master)	YES	NO
	X	

The members of the External Evaluation & Accreditation Panel

Name and Surname

Signature

- 1. Professor Theodore Stathopoulos (Chair)**
Concordia University, Canada
- 2. Professor Emeritus, Dimitrios Kolymbas**
Universität Innsbruck, Austria
- 3. Professor Panagiotis Scarlatos**
Florida Atlantic University, USA
- 4. Professor Nikiforos Stamatiadis**
University of Kentucky, USA