



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
HELLENIC REPUBLIC



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Accreditation Report **for the Postgraduate Study Programme of:**

Environmental Engineering and Science

Department: Environmental Engineering
Institution: Democritus University of Thrace

Date: 16 September 2023

Report of the Panel appointed by the HAHE to undertake the review of the Postgraduate Study Programme of **Environmental Engineering and Science** of the **Democritus University of Thrace** 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. Postgraduate Study Programme Profile.....	7
Part B: Compliance with the Principles	8
PRINCIPLE 1: QUALITY ASSURANCE POLICY AND QUALITY GOAL SETTING FOR THE POSTGRADUATE STUDY PROGRAMMES OF THE INSTITUTION AND THE ACADEMIC UNIT	8
PRINCIPLE 2: DESIGN AND APPROVAL OF POSTGRADUATE STUDY PROGRAMMES	11
PRINCIPLE 3: STUDENT-CENTRED LEARNING, TEACHING, AND ASSESSMENT	13
PRINCIPLE 4: STUDENT ADMISSION, PROGRESSION, RECOGNITION OF POSTGRADUATE STUDIES, AND CERTIFICATION	16
PRINCIPLE 5: TEACHING STAFF OF POSTGRADUATE STUDY PROGRAMMES	18
PRINCIPLE 6: LEARNING RESOURCES AND STUDENT SUPPORT	20
PRINCIPLE 7: INFORMATION MANAGEMENT	22
PRINCIPLE 8: PUBLIC INFORMATION CONCERNING THE POSTGRADUATE STUDY PROGRAMMES	25
PRINCIPLE 9: ON-GOING MONITORING AND PERIODIC INTERNAL EVALUATION OF POSTGRADUATE STUDY PROGRAMMES	27
PRINCIPLE 10: REGULAR EXTERNAL EVALUATION OF POSTGRADUATE STUDY PROGRAMMES	29
Part C: Conclusions	31
I. Features of Good Practice	31
II. Areas of Weakness	31
III. Recommendations for Follow-up Actions	31
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 postgraduate study Programme of **Environmental Engineering and Science** of the **Democritus University of Thrace** comprised the following four (4) members, drawn from the HAHE Register, in accordance with Laws 4009/2011 & 4653/2020:

1. Professor Emeritus, Spyros G. Pavlostathis (Chair)

Georgia Institute of Technology, Atlanta, United States of America

2. Professor Emeritus Nikolaos Katopodes

University of Michigan, Michigan, United States of America

3. Professor Theodore Stathopoulos

Concordia University, Montreal, Canada

4. Mrs. Despoina Boulogiorgou

Student, Department of Mechanical Engineering, University of West Attica, Athens, Greece

II. Review Procedure and Documentation

In preparation for the visit, the External Evaluation & Accreditation Panel (EEAP) reviewed multitude of material provided by the Hellenic Authority of Higher Education (HAHE), which included background information and guidance on the accreditation process, detailed material and data related to the Programme under evaluation, such as the Programme accreditation proposal and associated appendices.

The Programme review was conducted via teleconference, organized and coordinated by HAHE with the help of the Department of Environmental Engineering, Democritus University of Thrace. The schedule and agenda of the review were as stated below.

Monday, 04/09/2023:

- a) Preliminary private meeting of the EEAP. Discussion of the Programme under review; assignment of writing parts of the accreditation report draft to the members of the EEAP.
- b) Welcome meeting and short overview of the postgraduate study Programme (PSP) with the University Vice-Rector/President of MODIP Prof. M. Grigoriou, the Head of the Department Prof. S. Ntougias, and the Director of the PSP Prof. D. Komilis: presentation of Institution and PSP history, academic profile, current status and future developments, strengths and areas of concern.
- c) Meeting with: MODIP members Profs. N. Aggelousis, G. Sirakoulis, K. Antonopoulos, A. Markos, and A. Paschalidou; MODIP staff Mrs. S. Gkavaki and S. Marsidou; PSP Steering Committee Profs. A. Dimoudi, I. Nikolaou, and A. Stamatelatou; OMEA members Profs. I. Nikolaou, A. Gemitzi, and S. Zoras. Discussion of the degree compliance of the PSP to the quality standards for accreditation, internal procedures, course examinations, review of students' progress, course/instructor evaluations, etc.
- d) Meeting with the Head of the Department Prof. S. Ntougias, the Director of the PSP, Prof. D. Komilis, the PSP teaching staff, Profs. I. Nikolaou, A. Dimoudi, A. Gkemitzi, A. Stamatelatou, and S. Zoras and PSP administrative staff Mrs. A. Averopoulou and Mr. G. Ntampanlis. Discussion of Department and PSP facilities.
- e) Private debriefing meeting (EEAP members only).

Tuesday, 05/09/2023:

- a) Meeting and discussion with PSP faculty and teaching staff members: K. Elmasidis, K. Kourtidis, P. Melidis, G. Sylaios, K. Christoforidis, K. Athanasiou, S. Stathopoulos, and A. Kantzioura.
- b) Meeting and discussion with ten (10) current PSP students.
- c) Meeting and discussion with eleven (11) PSP graduates.
- d) Meeting and discussion with employers and PSP social partners from both private and public sector: Mr. C. Chatzopoulos, Solid Waste Association of the Region of East Macedonia and Thrace; Mr. I. Glarakis, Solid Waste Association of the Region of Central Macedonia; Mr. N. Marinakis, INTERGEO S.A.; and Mrs. I. Polatidou, Mesogeos S.A.
- e) Private debriefing meeting (EEAP members only): discussion of the outcomes and findings of the virtual visit; preparation of oral report.

- f) Closure meeting with the University Vice-Rector/President of MODIP, the Department Head, the PSP Director, MODIP members and staff, PSP Steering Committee members, and OMEA members: informal, oral presentation of the EEAP key findings.

Wednesday, 06/09/2023:

Draft report writing.

Thursday 07/09/2023 to Saturday 16/09/2023:

Draft report writing. EEAP virtual meetings. Review and finalization of draft report.

Throughout the review and evaluation process, the EEAP was in close communication with the University, the Head of the Department, and the PSP Director, who were very accommodating in providing additional information requested by the EEAP. The EEAP found that OMEA and MODIP representatives, as well as the faculty, students, and staff interviewed were eager and helpful in our discussions, providing all additional information requested by the EEAP.

III. Postgraduate Study Programme Profile

The postgraduate study Programme (PSP) "Environmental Engineering and Science" is organized and offered by the Department of Environmental Engineering of the Democritus University of Thrace (DUTH), located in Xanthi, Greece. The Programme began operation in 2009 and was upgraded and re-organized in 2018. Starting with the academic year 2022-2023, the Programme is offered completely remotely based on Law 4957/2022. From the academic year 2023-2024, the Programme is approved to be delivered in English. The PSP Environmental Engineering and Science is interdisciplinary in nature and offers three specializations:

- Climate change, renewable energy sources, and energy planning of buildings and settlements
- Technology and management of liquid and solid waste
- New technologies in water resources management

Teaching in the PSP is realized by faculty members of the Department of Environmental Engineering, faculty members of other departments/agencies, postdocs, and PhD candidates of the Department. In addition, non-tenure track teaching staff (EDIP), special technical staff (ETEP), and 2 administrative staff assist the PSP.

The Programme has set at 40 the maximum number of admitted students per academic year. In 2022, 37 students were admitted. From 2009 to 2022 the total number of admitted students was 316, while at the same time period the number of graduated students was 238, which results in 75% rate of graduation. Several of the postgraduate students the EEAP interviewed stated that the PSP Environmental Engineering and Science of the DUTH was among their first choice based on the combination of subjects covered and the specific specializations of the PSP.

The PSP is a three-semester study resulting in a Diploma of Postgraduate Studies. To graduate, the student must have successfully passed 8 courses from a total of 25 offered courses distributed among the three specializations, and a total of 90 European Credit Transfer System (ECTS) credits, 60 for coursework and 30 for the preparation and successful completion of a postgraduate thesis. In addition, postgraduate students must have attended the mandatory seminar series offered by the Programme. The EEAP found that the curriculum is extensive, covering advanced as well as new topics and technologies in Environmental Engineering and Science.

The PSP prepares graduates for careers in both the private and public sector of the economy. There are strong links to the society, Industry, and administration, both in the Regions of Macedonia and Thrace and beyond, which are key priority of the PSP and the Department.

The Department participates in other interdepartmental postgraduate programmes, supports doctoral studies, and the faculty carry research projects of regional, national, and international scope/needs.

PART B: COMPLIANCE WITH THE PRINCIPLES

PRINCIPLE 1: QUALITY ASSURANCE POLICY AND QUALITY GOAL SETTING FOR THE POSTGRADUATE STUDY PROGRAMMES OF THE INSTITUTION AND THE ACADEMIC UNIT

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 THE POSTGRADUATE STUDY PROGRAMMES OF THE INSTITUTION AND THE ACADEMIC UNIT. THIS POLICY SHOULD BE PUBLISHED AND IMPLEMENTED BY ALL STAKEHOLDERS.

The quality assurance policy of the academic unit should be in line with the quality assurance policy of the Institution and must be formulated in the form of a public statement, which is implemented by all stakeholders. It focuses on the achievement of special goals related to the quality assurance of the study programmes offered by the academic unit.

Indicatively, 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 postgraduate study Programme (PSP), its purpose and field of study; it will realise the Programme's goals and it will determine the means and ways for attaining them; it will implement appropriate quality procedures, aiming at the Programme's improvement.

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

- a) the suitability of the structure and organisation of postgraduate study programmes*
- b) the pursuit of learning outcomes and qualifications in accordance with the European and National Qualifications Framework for Higher Education - level 7*
- c) the promotion of the quality and effectiveness of teaching at the PSP*
- d) the appropriateness of the qualifications of the teaching staff for the PSP*
- e) the drafting, implementation, and review of specific annual quality goals for the improvement of the PSP*
- f) the level of demand for the graduates' qualifications in the labour market*
- g) the quality of support services, such as the administrative services, the libraries and the student welfare office for the PSP*
- h) the efficient utilisation of the financial resources of the PSP that may be drawn from tuition fees*
- i) the conduct of an annual review and audit of the quality assurance system of the PSP through the cooperation of the Internal Evaluation Group (IEG) with the Institution's Quality Assurance Unit (QAU)*

Study Programme Compliance

The Institution has developed and implemented its Quality Assurance Policy as part of its broader strategy (<https://duth.gr/en/University/Quality-Assurance-Unit>). The Department of Environmental Engineering, in collaboration with the Quality Assurance Unit (MODIP) of the University and Department Internal Evaluation Group (OMEA), has harmonized the quality policy of the Postgraduate Studies Programme with that of the University, accompanied by annual quality assurance targets for the continuous development and improvement of the Postgraduate Study Programme, as well as that of the academic unit and other teaching programmes.

The Quality Assurance Policy of the academic unit, which is publicly accessible from the Department website (<https://env.duth.gr/en/regulations/quality-assurance-policy/>), includes adequate reference to the delivery of the new postgraduate study Programme, including commitments to satisfy requirements and strive for continuous improvement. In addition to OMEA, a five-member departmental Coordinating Committee further aids in the overall quality assurance of the postgraduate study Programme and the Department.

The Quality Assurance Policy is sufficiently communicated to all parties involved as it is publicly available in the Departmental webpage. The academic unit has set specific, measurable, achievable, relevant and timely goals regarding the new postgraduate Programme. According to Quality Targets for the Programme, are at a satisfactory point in terms of achieving set targets. Based on the data presented to the EEAP, the targets are also paired with suitable key performance indicators (KPIs). Goals are monitored, updated, and communicated, according to the Quality Assurance Policy implemented by the Institution and the academic unit. The quality assurance system is reviewed on an annual basis by the OMEA and results communicated to the University MODIP.

The structure and organization of the postgraduate studies Programme is well thought out and in line with the overall goal of the Programme. The advanced material covered along with the study of new technologies in the area of Environmental Engineering and Science result in learning outcomes and qualifications of the postgraduate students consistent with Level 7 of the European and National Qualifications Framework for Higher Education. It is noteworthy that a number of postgraduate students of the Programme have continued doctoral studies.

On average, 55% (from 39% to 72%) of registered/active students participated in course/instructor evaluation, which is considered satisfactory for Greek Higher Education Institutes. The great majority of the students who participated in the evaluation (78.1%) answered that they would definitely recommend the Programme to a colleague.

Panel Judgement

Principle 1: Quality assurance policy and quality goal setting for the postgraduate study programmes of the institution and the academic unit	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

To enhance adherence to Principle 1, the EEA Panel recommends the following:

- The Department should make an effort to increase student participation in course/instructor evaluations. Improvements made should be communicated.

- Establishment of an External Advisory Board should be considered, which will guide the continuous review, revision, and further development of the curriculum.
- Interactions with alumni upon their graduation should be exploited as a potential means of informing the decision-making process regarding future directions of the Programme.

PRINCIPLE 2: DESIGN AND APPROVAL OF POSTGRADUATE STUDY PROGRAMMES

INSTITUTIONS SHOULD DEVELOP THEIR POSTGRADUATE STUDY PROGRAMMES FOLLOWING A DEFINED WRITTEN PROCESS WHICH WILL INVOLVE THE PARTICIPANTS, INFORMATION SOURCES AND THE APPROVAL COMMITTEES FOR THE POSTGRADUATE STUDY PROGRAMMES. THE OBJECTIVES, THE EXPECTED LEARNING OUTCOMES AND THE EMPLOYMENT PROSPECTS ARE SET OUT IN THE PROGRAMME DESIGN. DURING THE IMPLEMENTATION OF THE POSTGRADUATE STUDY PROGRAMMES, THE DEGREE OF ACHIEVEMENT OF THE LEARNING OUTCOMES SHOULD BE ASSESSED. THE ABOVE DETAILS, AS WELL AS INFORMATION ON THE PROGRAMME'S STRUCTURE ARE PUBLISHED IN THE STUDENT GUIDE.

The academic units develop their postgraduate study programmes following a well-defined procedure. The academic profile and orientation of the Programme, the research character, the scientific objectives, the specific subject areas, and specialisations are described at this stage.

The structure, content and organisation of courses and teaching methods should be oriented towards deepening knowledge and acquiring the corresponding skills to apply the said knowledge (e.g. course on research methodology, participation in research projects, thesis with a research component).

The expected learning outcomes must be determined based on the European and National Qualifications Framework (EQF, NQF), and the Dublin Descriptors for level 7. During the implementation of the Programme, the degree of achievement of the expected learning outcomes and the feedback of the learning process must be assessed with the appropriate tools. For each learning outcome that is designed and made public, it is necessary that its evaluation criteria are also designed and made public.

In addition, the design of PSP must consider:

- *the Institutional strategy*
- *the active involvement of students*
- *the experience of external stakeholders from the labour market*
- *the anticipated student workload according to the European Credit Transfer and Accumulation System (ECTS) for level 7*
- *the option of providing work experience to students*
- *the linking of teaching and research*
- *the relevant regulatory framework and the official procedure for the approval of the PSP by the Institution*

The procedure of approval or revision of the programmes provides for the verification of compliance with the basic requirements of the Standards by the Institution's Quality Assurance Unit (QAU).

Study Programme Compliance

The Panel was satisfied with the design and delivery of this PSP. The Programme is well designed and covers a broad selection of topics in the field of Environmental Engineering and Science. There are several elective courses addressing the professional interests of all students including those with scientific but non-engineering background. There is minimum overlapping with the content of similar undergraduate courses, so the students' needs to upgrade their knowledge is fully successful. The percentage of students graduating from this Programme (75%) is satisfactory and consistent with other similar programmes. The remote delivery of the Programme has been successful and critical for its development, notwithstanding the general

concern of the Panel about the remote learning mode, particularly for laboratory courses and technical visits.

The approved (for 2023-24 academic year) delivery of the Programme in the English language deems to be positive, although it may be problematic if the great majority of students have Greek as first language. It was also pointed out that the translation of all teaching material from Greek to English might be a challenging workload issue, at least for the first year of operation in English.

The Panel however found that the lack of a reasonable balance among the three (3) areas of student specializations might be problematic and requires attention. Indeed, the current distribution (85% - 15% - 0%) can be rectified by a potential cooperation with other similar programmes and/or by strategic marketing of the Programme. Having said this, it is remarkable to mention that the numerous alumni and stakeholders interviewed by the Panel expressed a very positive opinion of the Programme and the technical skills of the Programme graduates both in depth and breadth.

Panel Judgement

Principle 2: Design and approval of postgraduate study programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

To enhance adherence to Principle 2, the EEA Panel recommends the following:

The Panel recommends that the unbalanced distribution of students in the three branches of specialization be addressed by optimizing the various options available (strategic marketing/cooperation with other programmes, etc.)

PRINCIPLE 3: STUDENT-CENTRED LEARNING, TEACHING, AND ASSESSMENT

INSTITUTIONS SHOULD ENSURE THAT POSTGRADUATE STUDY PROGRAMMES PROVIDE THE NECESSARY CONDITIONS TO ENCOURAGE STUDENTS TO TAKE AN ACTIVE ROLE IN THE LEARNING PROCESS. THE ASSESSMENT METHODS SHOULD REFLECT THIS APPROACH.

Student-centred learning and teaching plays an important role in enhancing students' motivation, their self-evaluation, and their active participation 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 by adopting 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*
- *strengthens 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 the students' complaints*
- *provides counselling and guidance for the preparation of the thesis*

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.*
- *Assessment is consistent, fairly applied to all students and conducted in accordance with the stated procedures.*
- *A formal procedure for student appeals is in place.*
- *The function of the academic advisor runs smoothly.*

Study Programme Compliance

The PSP values and addresses the diverse needs of its students by embracing flexible learning pathways, both within the realm of multiculturalism and cognitive domains. The faculty members are well-versed in the various academic backgrounds of their students, allowing them to adapt teaching methods to each class unique requirements. Due to the limited class size and the extensive teaching experience of the teaching staff, these needs are met. Distance education has been chosen as the primary mode, which was notably tested during the COVID-19 pandemic. This experience allowed for the exploration of this method and the assessment of postgraduate students' response, with the majority expressing high satisfaction with distance learning. It proved particularly convenient for those who were employed, serving as

an opportunity to enhance their digital and professional skills. The integration of digital technology has progressively facilitated the achievement of new learning objectives.

Regular evaluations for both the PSP and academic staff occur twice annually and towards the end of each semester. Students provide anonymous feedback through surveys to assess the quality and effectiveness of teaching. The questionnaires encompass three categories of questions: 1) general inquiries about the PSP "Environmental Engineering and Science" (6 questions); 2) assessments of course quality (6 questions); and 3) evaluations of individual teachers (6 questions). Faculty members are deeply committed to adjusting delivery methods and pedagogical approaches with a focus on improvement. During the evaluation and accreditation process, committee members encountered students who affirm a mutual respect in the student-teacher relationship. Additionally, procedures are in place to address student complaints.

Academic staff members offer counselling and guidance, and university laboratories are accessible to students for assignment preparation, laboratory work, and thesis development, for those who may be present on campus. The faculty is well-acquainted with the existing examination system and methods, and they receive support to further develop their skills in this area. The assessment criteria and methods are made available in advance, enabling students to showcase their attainment of the intended learning outcomes. Feedback is provided to students, and when needed, it is connected to guidance on the learning process.

The assessment process is uniform and fairly administered to all students, adhering to the established protocols. There is a formal process in place for student appeals. The role of academic advisors operates efficiently.

From the assessment of the Programme, the student-centred approach of the postgraduate Programme was evident, along with the academic staff's ability to meet this task and the successful implementation of existing procedures. There is room for improvement in the methods, processes, and tools used for the student-centred approach.

The rules and regulations that have been developed for this Programme student-centred learning, teaching and assessment and degree award to students are considered adequate.

Panel Judgement

Principle 3: Student-centred learning, teaching, and assessment	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

To enhance adherence to Principle 3, the EEA Panel recommends the following:

- The twice-yearly questionnaire assessment process could be combined with a collection of views before the start of the postgraduate Programme on the expectations of incoming students. The results should be statistically analysed, and the conclusions be communicated to the students.
- Every year, the changes selected for implementation based on the questionnaire results is recommended to be evaluated and discussed with the students.

PRINCIPLE 4: STUDENT ADMISSION, PROGRESSION, RECOGNITION OF POSTGRADUATE STUDIES, AND CERTIFICATION

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

All the issues from the beginning to the end of studies should be governed by the internal regulations of the academic units. Indicatively:

- *the student admission procedures and the required supporting documents*
- *student rights and obligations, and monitoring of student progression*
- *internship issues, if applicable, and granting of scholarships*
- *the procedures and terms for the drafting of assignments and the thesis*
- *the procedure of award and recognition of degrees, the duration of studies, the conditions for progression and for the assurance of the progress of students in their studies*
- *the terms and conditions for enhancing student mobility*

All the above must be made public in the context of the Student Guide.

Study Programme Compliance

The selection process for students is detailed in the Internal Operating Regulations of the PSP. The Department, on dates determined by the Assembly, issues a call for expressions of interest, announcing open positions for the admission of graduates to the PSP.

The selection criteria for candidates include: (1) Relevance of undergraduate studies, (2) Overall GPA of the Bachelor's degree, (3) Detailed grades in undergraduate courses relevant to the PSP Programme, (4) Grade and relevance to the subject of the thesis, (5) Relevant postgraduate studies, (6) Adequate knowledge of a foreign language, (7) Knowledge of a second or additional foreign languages, (8) Relevant research or professional activity of the candidate relative to the PSP subject, (9) Recommendation letters, (10) Publications and authorship activity.

Every year, during the first week of October when classes begin, the Director of the PSP organizes an informative online meeting with incoming students. Professors who teach in the PSP also participate in this meeting. Its aim is to provide incoming students with information about the subjects of their studies, employment opportunities, as well as essential details about the structure and characteristics of the study Programme (credit units, ECTS, expected learning outcomes), which are detailed in the study guide.

Assessment of performance in courses can be conducted through written or oral examinations, assignments, presentations, or a combination of these methods, exclusively through distance. The terms and criteria for assessment in each course are communicated at the beginning of the course by the respective instructor or course coordinator.

According to the internal regulations of the PSP, scholarships or excellence awards are granted to graduate students by the decision of the Department Assembly. The PSP does not participate in mobility programmes, as it is designed to provide postgraduate education,

research, and specialization for the generation of new knowledge in contemporary Environmental fields within three (3) semesters.

There are necessary documents that accurately describe the required procedures for participation in the postgraduate Programme, the rights and obligations of the students, the assessment requirements, and the completion of their thesis work. The committee recognized the effective organization of the postgraduate Programme and the quality of the regulations that promote the academic culture and the value of knowledge.

The rules and regulations that have been developed for this Programme guiding admission, progression, recognition and degree award to students are considered adequate.

Panel Judgement

Principle 4: Student admission, progression, recognition of postgraduate studies and certification	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

To enhance adherence to Principle 4, the EEA Panel recommends the following:

For the internationalization of the PSP it is recommended short visits to similar university programmes abroad through pre-existing undergraduate agreements; educational tours of the respective postgraduate study programmes at these institutions can be organized. A tactic that will also strengthen the interaction with foreign students interested in the PSP

PRINCIPLE 5: TEACHING STAFF OF POSTGRADUATE STUDY PROGRAMMES

INSTITUTIONS SHOULD ASSURE THEMSELVES OF THE LEVEL OF KNOWLEDGE AND SKILLS OF THEIR TEACHING STAFF, AND APPLY FAIR AND TRANSPARENT PROCESSES FOR THEIR RECRUITMENT, TRAINING AND FURTHER DEVELOPMENT.

The Institution should attend to the adequacy of the teaching staff of the academic unit teaching at the PSP, the appropriate staff-student ratio, the appropriate staff categories, the appropriate subject areas, the fair and objective recruitment process, the high research performance, the training- development, the staff development policy (including participation in mobility schemes, conferences, and educational leaves-as mandated by law).

More specifically, the academic unit should set up and follow clear, transparent and fair processes for the recruitment of properly qualified staff for the PSP and offer them conditions of employment that recognise 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 (with respect to attendance requirements, performance, self-assessment, training, etc.); develop policies to attract highly qualified academic staff.

Study Programme Compliance

The Panel found that the Teaching staff of the PSP has excellent qualifications to teach the syllabus of the Programme and both students and graduates interviewed were unanimous in their appreciation for the Professors' qualifications to teach promptly and in the appropriate depth for a post-graduate Programme. Students are also assisted with their projects (a selection examined have the characteristics of mini thesis) by all Teaching staff, although the remote delivery of the Programme presents extra difficulties in this regard. There was no specific reference to training programmes for Academics, although the fact that these are the same Professors teaching the accredited undergraduate Programme of Environmental Engineering assures the Panel of the compliance with this principle. Support is available through an Office of teaching and learning. This Office provides support to the Teaching staff by responding to all questions and organizing teaching seminars in regular intervals. The student-teaching ratio in this PSP is very low, ranging from 2:1 to 0.5:1. This is very advantageous for the student learning process.

The Panel noted that there is a significant interest in research activities. A small number of students graduated from this Programme follow doctoral studies with their project supervisors. This is an excellent by-product of this Programme contributing to the academic targets of the faculty members to promote their academic objectives and obtain research funding via various European programmes (e.g., Horizon). This in turn promotes the increase of the volume and quantity of the research output from the Department of Environmental Engineering.

Finally, the Panel found that the workload of the Teaching staff is satisfactory, also considering the possibility to receive extra funding from the tuition fee income of the PSP. In practice

however, these funds are used to create scholarships for the students, an excellent objective, as well as to provide funds related to students research activities.

Panel Judgement

Principle 5: Teaching staff of postgraduate study programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

The EEA Panel has no specific recommendations relative to adherence to Principle 5.

PRINICPLE 6: LEARNING RESOURCES AND STUDENT SUPPORT

INSTITUTIONS SHOULD HAVE ADEQUATE FUNDING TO COVER THE TEACHING AND LEARNING NEEDS OF THE POSTGRADUATE STUDY PROGRAMME. 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, NETWORKS, CAREER AND SOCIAL POLICY SERVICES ETC.).

Institutions and their academic units must have sufficient resources and means, on a planned and long-term basis, to support learning and academic activity in general, so as to offer PSP students the best possible level of studies. The above means include facilities such as the necessary general and more specialised libraries and possibilities for access to electronic databases, study rooms, educational and scientific equipment, IT and communication services, support and 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 students, students with disabilities), in addition to 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 proves -on the one hand- the quantity and quality of the available facilities and services, and -on the other hand- that students are aware of all available services.

In delivering support services, the role of support and administration staff is crucial and therefore this segment of staff needs to be qualified and have opportunities to develop its competences.

Study Programme Compliance

The Department of Environmental Engineering and the PSP have building and laboratory facilities adequate for their mission. It should be noted that all spaces are easily accessible to individuals with disabilities.

The human resources of the PSP consist of the Teaching and Research Staff, which includes 11 Professors, 4 Associate Professors, and 3 Assistant Professors. Additionally, there is 1 member of the Laboratory Teaching Staff, as well as at least 5 Scientific Collaborators (postdoctoral researchers or doctoral degree holders) who contribute to both the educational and research activities of the PSP and the Department of Environmental Engineering. The administrative staff of the PSP comprises 1 member (technical support), while the department has 3 administrative members. The Coordinating Committee of the PSP consists of 5 Teaching and Research Staff members from the Department of Environmental Engineering. The personnel of the PSP is also supported by specialized personnel from the central services of the Democritus University of Thrace.

The main service for supporting learning and academic activities is the network of libraries within the institution, especially the Library of the Polytechnic School. Education is supported by an online learning management system. Each course has its own virtual classroom where various materials, announcements, and bibliographic resources are posted.

Through the Employment and Career Structure (DASTA), students of all levels and recent graduates are offered the opportunity to explore their future career environment and, at the same time, acquire knowledge and skills that will enable them to compete more effectively in the professional field.

The needs of all students are considered, including factors like their employment status, and any disabilities they may have. The PSP provides all the learning resources and student support personnel and services needed for carrying out this PSP. The careful coordination among all Offices and Services needed for successfully administering the PSP is evident.

The committee has concluded that the PSP has carefully considered and planned for all aspects of university resources and student support needed for the implementation of the PSP.

Panel Judgement

Principle 6: Learning resources and student support	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

To enhance adherence to Principle 6, the EEA Panel recommends the following:

For safety reasons, given the interdisciplinary nature of this PSP, it is essential to exercise caution when student teams are working in laboratories. This practice will not only be relevant for those who prepare their diploma in the University's facilities but also for their knowledge in the professional field.

PRINCIPLE 7: INFORMATION MANAGEMENT

INSTITUTIONS BEAR FULL RESPONSIBILITY FOR COLLECTING, ANALYSING AND USING INFORMATION, AIMED AT THE EFFICIENT MANAGEMENT OF POSTGRADUATE STUDY PROGRAMMES 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.

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

The information collected 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 programmes*
- *availability of learning resources and student support*

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

Study Programme Compliance

The Postgraduate Study Programme (PSP) in Environmental Engineering and Science of Democritus University of Thrace (DUTH) has established an integrated and well-documented procedure for the collection of data concerning the Programme activities. The PSP monitors the status of the students, the effectiveness of teaching methods, the progression of the students through the Programme, and the employment opportunities that become available. The data collection is performed using several information systems for electronic registration and evaluation. The information focuses on course evaluations by the students based on electronic questionnaires, a survey of equipment by the laboratory directors, the documentation of research projects by a central system, and the support services for the students by the General Counsel Office and student counselling services of DUTH. The electronic system supports the collection and analysis of data, and its dissemination to the faculty. Student satisfaction surveys are regularly conducted, followed by a questionnaire one year after graduation.

The course evaluation is embraced by both the faculty and the students. However, the evaluation is conducted only at the end of the semester, which does not allow for immediate response to current issues. A mid-term evaluation may be valuable in providing short-term remedies and long-term modifications, especially when compared and contrasted to the final evaluation of the semester. A thorough presentation of the data collected and analysed by the evaluation system was made available to the EEAP. The data collection results are accurately documented; however, the results are not made available to the students. This is a deviation from international standards where the transparency of student feedback is used to

demonstrate a Programme's ability to respond to student concerns, and to continuously improve the educational process.

The PSP has made an effort to stay in contact with the alumni of the Programme in order to strengthen the ties among students, faculty and graduates, and to receive feedback for the Programme. Recent graduates of the PSP have a high respect for the education they received, and are enthusiastic about their potential involvement with the Programme. The group of graduates interviewed by the EEAP indicated that they had only participated in one post-graduation survey, thus the PSP may benefit from following up with its graduates at five- and ten-year intervals.

The information provided to the EEAP regarding student enrolment reveals that one of the specializations within the Programme has been inactive for several years. The fact that this area happens to be an outstanding part of the Programme in terms of research productivity, international reputation, and overall quality makes the lack of interest by the students difficult to comprehend. No explanation was offered by the PSP, and there is no evidence of any active measures to remedy the situation. As a minimum, the student questionnaires should be reviewed in an effort to shed some light on this conundrum.

The PSP does not currently have an external advisory board. The importance of the establishment of such a board cannot be overemphasized. The continuous improvement of a graduate Programme depends strongly on its ability to adopt new subjects and methods that are relevant to government, industry and the society in general. An external board would create a link to the real world, bring visibility to the Programme, and attract new resources for its support.

Panel Judgement

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

Panel Recommendations

To enhance adherence to Principle 7, the EEA Panel recommends the following:

- The EEAP commends the efforts of the PSP to optimize the data capture methods, and the use of the information to continuously improve the educational process. The course evaluation process could be further improved by conducting a mid-term evaluation and making the results available to the students.
- The PSP has made some efforts to connect with the alumni of the Programme. These efforts should be intensified by including recent graduates in the evaluation process, conducting additional surveys of graduates, and trying to engage them in promoting the mission of the Programme.

- It became evident during the interviews with employers and senior stakeholders of the PSP that this group represents an untapped resource that could bring immense benefits to the Programme. The EEAP feels that this group should be included in the formal information exchange and should be invited to participate in the educational process.
- The PSP should provide stronger support to its third specialization, which is currently under-subscribed. Perhaps an introductory course during the first semester could be used to attract students. Alternatively, the PSP could establish a series of seminars or mini courses, offered at the beginning of the first semester without credit, and may expose the students to the potential skills they can acquire in each of the three specialties.
- An External Advisory Board should be created and invited to meet once a semester with the faculty and administration.

PRINCIPLE 8: PUBLIC INFORMATION CONCERNING THE POSTGRADUATE STUDY PROGRAMMES

INSTITUTIONS SHOULD PUBLISH INFORMATION ABOUT THEIR TEACHING AND ACADEMIC ACTIVITIES RELATED TO THE POSTGRADUATE STUDY PROGRAMMES IN A DIRECT AND READILY ACCESSIBLE WAY. THE RELEVANT INFORMATION SHOULD BE UP-TO-DATE, OBJECTIVE AND CLEAR.

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

Therefore, Institutions and their academic units must provide information about their activities, including the PSP they offer, the intended learning outcomes, the degrees awarded, the teaching, learning and assessment procedures applied, the pass rates, and the learning opportunities available to their students. Information is also provided on the employment perspectives of PSP graduates.

Study Programme Compliance

The Panel noted an active web site with information regarding the basic particulars of the Programme. The information is provided in Greek, although the Panel learned that an English side is being prepared, since the Programme will operate in English, effective on the 2023-24 academic year. Although the minimal information regarding the Programme, the admission and other academic requirements, the courses available, etc., are well described, there are other important elements missing. The Panel believes that such inadequacies can be easily corrected and by doing so, the Programme will get an enormous benefit. Needless to say, that regular updating of this site would be indispensable.

To be more specific, the Panel suggests that in addition to the current “static” information provided, some additional “dynamic” information would make a significant difference to the marketing and attractiveness of the Programme. This may include the extremely important “External Advisory Board”, its membership, the strategic thematic issues considered, the scheduling of their meetings, etc.; activities in the Programme and beyond, such as seminars, invited speakers, student and graduate achievements, technical visits planned or considered, as well as discussion panels on various relevant environmental issues (fires, floods, etc.). Publicizing such activities makes a significant difference in the promotion of academic and industrial linkages. Research efforts, such as significant publications, successful grant applications, cooperation with other programmes and national/international organizations would be a source of inspiration for potential prospective students and would increase the visibility of the Programme locally and abroad.

Finally, the organization of an open house and selected interviews with successful graduates could be included – after obtaining the necessary permissions – as another avenue to promote, enhance and publicize (communicate) the quality of the Programme.

Panel Judgement

Principle 8: Public information concerning the postgraduate study programmes	
Fully compliant	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

To enhance adherence to Principle 8, the EEA Panel recommends the following:

Particular attention be paid to the enhancement and the regular updating of the web site of the Programme.

PRINCIPLE 9: ON-GOING MONITORING AND PERIODIC INTERNAL EVALUATION OF POSTGRADUATE STUDY PROGRAMMES

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

The regular monitoring, review, and revision of postgraduate study programmes aim at maintaining the level of educational provision and creating a supportive and effective learning environment for students.

The above comprise the evaluation of:

- a) the content of the Programme in the light of the latest research in the given discipline, thus ensuring that the PSP is up to date*
- b) the changing needs of society*
- c) the students' workload, progression and completion of the postgraduate studies*
- d) the effectiveness of the procedures for the assessment of students*
- e) the students' expectations, needs and satisfaction in relation to the Programme*
- f) the learning environment, support services, and their fitness for purpose for the PSP in question*

Postgraduate study 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.

Study Programme Compliance

There is an annual internal evaluation of the PSP, which includes the compilation of an internal report regarding the teaching and research outcomes of the Programme. This includes all research projects, publications, and course evaluations. The reports are processed by MODIP and are distributed for the internal evaluation of the PSP. MODIP also enforces the timely submission of the Programme's information.

The PSP is continuously updated with current research findings in the subject area, as reflected by the sample of student dissertations provided to the EEAP. The Programme also takes into account the evolving needs of society, such as climate change, and emerging environmental issues.

The interviews with students, alumni and employers strongly support the impression of the EEAP that the Programme is continuously monitored and improved. In their totality, students and alumni believe that the course content, depth of material and its delivery are an excellent extension to the undergraduate studies. For the students without an undergraduate engineering degree, integration seems reasonable although no remedial courses are offered.

The evaluation of the learning environment, the support services, and the continuous improvement of the course of study create an environment conducive to deep learning. The members of the teaching faculty are highly qualified, and the delivery of the material is highly effective. One area of potential improvement would be to invest some effort in creating enhanced methods for distant learning. It should not be limited to simply presenting a lecture

on-line but adopting active student engagement approaches and providing laboratory sessions based on virtual reality techniques.

Finally, it is very important to fully adopt the plan for instruction in English, and to expand the PSP internationally, as soon as possible. This will increase the visibility of the PSP and allow it to become a leader in the Eastern Mediterranean region.

Panel Judgement

Principle 9: On-going monitoring and periodic internal evaluation of postgraduate study programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

To enhance adherence to Principle 9, the EEA Panel recommends the following:

- Consider offering remedial courses for non-engineering graduates. These could be courses from the standard undergraduate curriculum.
- Consider adopting advanced methods for on-line instruction to improve student engagement. For laboratory sessions, virtual reality, and videos with detailed instructions for the use of equipment may also be valuable to offering a hands-on experience.
- Implement instruction in English and recruit international students. This could provide significant new resources to the PSP and increase the visibility of the Programme.

PRINCIPLE 10: REGULAR EXTERNAL EVALUATION OF POSTGRADUATE STUDY PROGRAMMES

THE POSTGRADUATE STUDY PROGRAMMES SHOULD REGULARLY UNDERGO EVALUATION BY PANELS 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 PSP accreditation process which is realised as an external evaluation procedure, and implemented by panels of independent experts. HAHE grants accreditation of programmes, based on the Reports delivered by the panels of external experts, with a specific term of validity, following to which, revision is required. The quality accreditation of the PSP acts as a means for the determination of the degree of compliance of the Programme to the Standards, and as a catalyst for improvement, while opening new perspectives towards the international standing of the awarded degrees. Both academic units and Institutions must consistently consider the conclusions and the recommendations submitted by the panels of experts for the continuous improvement of the Programme.

Study Programme Compliance

The faculty and administration of the PSP appear to place a great significance on the accreditation exercise and the improvement of the Programme. There was evidence of a serious commitment across the DUTH to the participation of faculty, students, graduates and external stakeholders to the evaluation process. The preparation effort and collegiality afforded to the EEAP was exemplary.

This was the first time that the PSP had undergone an external evaluation, thus there are no data or recommendations that could have been followed from a previous evaluation. However, the EEAP has accessed the last external evaluation of the undergraduate Programme in Environmental Engineering at DUTH, which indicates that the Department's administration and MODIP are very serious about addressing the recommendations of the EEAP and the guidelines of HAHE. On the basis of this evidence, the EEAP is confident that the PSP will address the present recommendations with similar professionalism.

In anticipation of future evaluation cycles, the PSP should consider adopting some alternative assessment methods for student learning. Implicit evaluation methods are available in the literature that may reveal hidden problems that an explicit questionnaire cannot discover. For example, asking students to "state your degree of your confidence in designing a specific environmental engineering operation" reveals more about learning than asking them to rate the statement: "The course is interesting and provides important information". The latter usually receives a positive answer but does not assess what the student learned. The former however, forces the students to decide the degree of competence they have achieved in this course.

Panel Judgement

Principle 10: Regular external evaluation of postgraduate study programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

To enhance adherence to Principle 10, the EEA Panel recommends the following:

The PSP should continue its current efforts. Because some of the recommendations require additional resources, which may or may not be currently available, the EEAP strongly advises the Programme to engage the regional government and industry leaders who participated in the interviews. They seem eager to support the Programme; thus they should be approached with a relevant proposal.

PART C: CONCLUSIONS

I. Features of Good Practice

- The Department has implemented compliant, efficient mechanisms for monitoring and ensuring high quality of work and services relative to the PSP. Quality assurance policies are already implemented regarding teaching delivery, assessment, and student progression. The existing quality assurance and continuous improvement policy aims to align practices with the strategic objectives the Department and the Institution.
- The faculty and staff are enthusiastic and dedicated to their mission. The students' overall experience is very positive. The enthusiasm of current students, employers, and other stakeholders was evident.
- The faculty and research staff are conducting research of regional, national, and international significance. The Department has developed collaborative research projects with other Universities and Research Centres.
- The participation of women in teaching, research, and administration is valued and recognized. The student gender ratio is balanced; more than half of the student representatives that met with the EEAP were women.
- A collegial and friendly atmosphere exists among faculty, staff, and students.
- The local labour market in the area of Eastern Macedonia and Thrace sees a clear need for graduates of the postgraduate studies Programme.
- Well-equipped laboratories are available. Student engagement in funded research projects is encouraged.

II. Areas of Weakness

- Lack of a reasonable balance in terms of students among the three areas of student specializations.
- The existing Programme website needs improvement; English version should be completed.
- There are limited interactions with alumni after graduation.
- Lack of an External Advisory Board.

III. Recommendations for Follow-up Actions

- Establish a formal process for the active participation of students in the curriculum development of the Programme.
- Enhance and update regularly the web site of the Programme, including the complete development of a version in English.

- Evaluate the reasons that student enrolment in one of the PSP specializations has been inactive. Consider actions that will introduce this area of specialization to the students during the first semester and/or other measures that will increase the interest by the students.
- Consider adopting advanced methods for on-line instruction to improve student engagement; for laboratory sessions, virtual reality, and videos with detailed instructions for the use of equipment should be used.
- Implement instruction in English and recruit international students.
- Establish an External Advisory Board which will guide the continuous review, revision, and further development of the PSP curriculum, and enhance the entire Programme.

IV. Summary & Overall Assessment

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

The Principles where substantial compliance has been achieved are: **7, 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 members of the External Evaluation & Accreditation Panel

Name and Surname

- 1. Professor Emeritus, Spyros G. Pavlostathis (Chair)**
- 2. Professor Emeritus Nikolaos Katopodes**
- 3. Professor Theodore Stathopoulos**
- 4. Mrs. Despoina Boulogiorgou**