



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
HELLENIC REPUBLIC



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Accreditation Report

for the Postgraduate Study Program of:

**Environmental Catalysis for Pollution Abatement
and Clean Energy Production**

Department: School of Science and Technology

Institution: Hellenic Open University

Date: 14 October 2023



Ευρωπαϊκή Ένωση
Ευρωπαϊκό Κοινωνικό Ταμείο

Επιχειρησιακό Πρόγραμμα
Ανάπτυξη Ανθρώπινου Δυναμικού,
Εκπαίδευση και Διά Βίου Μάθηση
Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης



ΕΣΠΑ
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Report of the Panel appointed by the HAHE to undertake the review of the Postgraduate Study Programme of **Environmental Catalysis for Pollution Abatement and Clean Energy Production** of the **Hellenic Open University** for the purposes of granting accreditation.

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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 Catalysis for Pollution Abatement and Clean Energy Production** of the **Hellenic Open University** comprised the following four (4) members, drawn from the HAHE Register, in accordance with Laws 4009/2011 & 4653/2020:

- 1. Professor Emeritus Spiros Agathos (Chair)**
Université Catholique de Louvain, Belgium

- 2. Professor Emeritus George Haritos**
The University of Akron, United States of America

- 3. Professor Apostolos Kantzas**
University of Calgary, Canada

- 4. Mr. Manolis Tabouratzis, PhD student**
University of the Aegean, Greece

II. Review Procedure and Documentation

The Accreditation Review of the Postgraduate Study Programme (PSP) of Quality Management and Technology (formerly Quality Assurance, QMT) – PSP1 -- and of the PSP of Environmental Catalysis for Pollution Abatement and Clean Energy Production (formerly Catalysis and Environmental Protection, ECPACEP) – PSP2 -- of the Hellenic Open University (HOU) were assigned to the same External Evaluation and Accreditation Panel (EEAP). In preparation for these reviews, the members of the External Evaluation and Accreditation Panel (EEAP) were able to examine a wide range of documents provided in advance by HAHE, including the Proposal for Accreditation of each Postgraduate Programme, the Study Guide, the description of courses, the HAHE Guidelines and other relevant information about each Programme (statistical data, quality indicators, student questionnaires, strategic goals, etc.). The EEAP also consulted the website of the Institution and Programmes.

The Accreditation Review was online. The process took place from Monday 09/10/2023 till Wednesday 11/10/2023. It was preceded by a private meeting of the EEAP on Monday 16:00 - 17:00 (via Zoom) and was followed by further private meetings of the EEAP on the following days to finalize the reports. During the review the EEAP had the following meetings:

Monday 09 October 2023

- a) 17:30 - 18:30 Virtual meeting of EEAP with the Vice-President/President of MODIP Prof. Ioannis Sibetheros and the Directors of the two PSP: Associate Prof. Giorgios Balomenos (PSP 1) and Associate Prof. Kyriakos Bourikas (PSP 2), Steering Committee Prof. Vasileios Kostopoulos, the Dean of the School of Science and Technology Prof. Achilleas Kameas, MODIP member Professor Georgios Chatzigeorgiou, OMEA member Associate Prof. Theofanis Orphanoudakis and MODIP staff members Evangelia Kaldani, Nikos Karousos (Internal Evaluation Unit) and Serafeim Karaiskakis (Strategic Planning & Development Office). The Head of the MODIP, the Dean and the Heads of Programmes PSP1 and PSP2 gave overviews on distance learning at HEU as well outlined as the current situation of the study programmes under review.
- b) 18:30 - 19:00 Virtual meeting of EEAP with Adjunct Teaching Staff (SEP) of PSP1 Prof. Associate Prof. Giorgios Balomenos, Teaching staff members (DEP) of PSP2 Associate Prof. Kyriakos Bourikas, Chief Administrative Officer Marianna Taliouri, Administrative staff members Mara Thanopoulou (Library), Alexandra Christakopoulou (Personnel Department), Aimilia Kokkineli (Liaison office), Dimitrios Ikononou (Student Registry Department) and Giorgios Temponeras (Premises and Building Projects Department, Office Application and Software Team). The EEAP was given an online tour of classrooms, lecture halls, libraries, laboratories, and other facilities related to the two PSP. A discussion ensued about the facilities presented in the video, focusing on learning materials, equipment and resources for the two PSP.
- c) 19:00 – 19:30 Debrief Meeting with EEAP members only.

Wednesday, 11 October 2023

- a) 16:30 - 17:15 Meeting of EEAP with the teaching staff of the PSP2 (ECPACEP). Meeting with the teaching staff of the PSP2 Prof. Christos Kordulis, Prof. Dimitris Kondarides, Associate Prof. Christos Trapalis, Prof. Maria Goula, Dr. John Vakros, Prof. Soghomon Boghosian, Prof. Michail Konsolakis and Assistant Prof. Aris Giannakas. The discussion addressed professional development opportunities, mobility, competence and adequacy of the teaching staff to ensure learning outcomes, workload, evaluation by students; link between teaching and research; teaching staff's involvement in applied research, projects and research activities directly related to the programme; possible areas of weakness.

- b) 17:15 - 18:00 Meeting with PSP2 students. The EEAP discussed students' satisfaction from their study experience and Department / Institution facilities; student input in quality assurance; priority issues concerning student life and welfare.
- c) 19:00 – 19:45 Meeting with PSP2 graduates who discussed with EEAP members their experience of their postgraduate studies and their career path.
- d) 19:45- 20:30 Meeting with employers, social partners of the PSP1 who discussed with EEAP members relations of the PSP2 with external stakeholders from the private and the public sector.
- e) 20:30 – 21:00 Debrief Meeting. EEAP members alone discussed the outcomes of the virtual visit and started to prepare the oral report.
- f) 21:00 - 21:30 Closure meeting with the Director of the PSP2, the Head of the Department, MODIP, and PSP2 Steering Committee/OMEA members. In this final meeting the EEAP provided a general view of some of the conclusions reached.

The EEAP members are pleased to point out that all the above meetings were held in an exemplary climate of constructive exchange. Overall, the institutional leadership, the faculty and the staff members had prepared a thorough review programme with presentations and in-depth discussions. A number of reports and other documents were provided to the EEAP during the visit at the request of the EEAP members. All members of the Programme were ready and eager to answer the questions by the EEAP and provide clarifications where needed, thus facilitating the EEAP's work in the evaluation and accreditation process.

III. Postgraduate Study Programme Profile

The Postgraduate Study Programme (PSP) on Environmental Catalysis for Pollution Abatement and Clean Energy Production (ECPACEP) seeks to prepare highly skilled professionals specialized in the science of catalysis and especially its contribution to environmental protection (anti-pollution) and the production of clean energy.

The graduates of this PSP are expected to be able to: contribute substantially to the study, operation and development of processes aimed at the destruction/inactivation of pollutants and the production of conventional and alternative environmentally friendly fuels; participate in research and development programmes aimed at the development of new catalysts for pollution control and green energy production; and to begin the preparation of a Doctoral Thesis in a related scientific field.

The PSP initially known as “K.P.P.” started in 2002 and is one of the oldest and most widely recognized postgraduate programmes offered by the Hellenic Open University:

(Programme website: <https://www.eap.gr/education/postgraduate/annual/environmental-catalysis-for-pollution-and-clean-energy-production/>)

It targets mature students who will implement the outcomes of their studies into their work. It leads to a Master’s degree and it is aligned with the European Credit Transfer System (ECTS) and has a minimum duration of 2 years.

To obtain the Master’s degree, 120 ECTS are required. The curriculum is composed of four (4) modules (Thematic Units) (20 ECTS each) with focus, respectively, on catalysis, catalytic surfaces, anti-pollution processes and clean energy production. Special emphasis is placed on interdisciplinarity – students from a variety of industrial sectors participate in the programme.

To complete the programme, the students are required to do a substantial diploma thesis (40 ECTS) that is more akin to M.Sc. theses in conventional learning institutions. The average length of study in practice is 4 years and the average GPA of the programme’s graduates is 8.00 (out of 10).

The students enrolled in the ECPACEP Programme during the academic year 2022-2023 formed 4 sections (each section comprising an average of 17 students) and they were taught by 4 instructors.

Total number of graduates since the PSP’s inception: 361.

The HOU and the ECPACEP Programme have taken substantial measures to provide essential support services to their PSP students. These services encompass administrative support, access to libraries, and a student welfare office. Additionally, the wide array of support services, including scholarship and internship offices, underscores the institution's commitment to comprehensive student development.

The Programme provides comprehensive support services to PSP students. The emphasis on electronic resources in the library system aligns with contemporary educational needs, ensuring that students have immediate access to vital academic information. These findings reflect positively on the Programme's efforts to create an environment conducive to effective learning and student success. HOU has demonstrated a strong commitment to providing robust support services to its PSP students. The comprehensive suite of support services, including scholarship and internship offices, enriches the overall student experience. However, continuous efforts to

enhance awareness and accessibility of these services among students could further improve the support system.

The teaching material is regularly updated through the incorporation of current digital subject matter and the distribution of printed material. Furthermore, the students are provided with alternative study material (extended answers to multiple choice questions), slides of the presentations during Group Counselling Meetings (GCM), scientific articles from current international bibliography, auxiliary teaching materials, notes, web hyperlinks, exercises, solved past essays, solved past exams, etc.

Overall, the prospects for further development of the EPACEP Programme are bright, given the growing needs of society and the economy for competent professionals that will be able to staff: (a) educational structures for the implementation of environmental education and the familiarization of students with renewable energy and sustainable development, (b) industrial facilities operating either pollution control units or conventional and green fuel production units, and (c) universities and research centers pursuing R&D aimed at the development of new catalysts for pollution control and for the production of environmentally friendly conventional and alternative fuels.

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)*

Documentation

- *Quality Assurance Policy of the PSP*
- *Quality goal setting of the PSP*

Study Programme Compliance

a) The suitability of the structure and organisation of Postgraduate Study Programmes

The organization of the PSP is explained in comprehensive documents provided to the EEAP that illustrate how the structure and organization of the postgraduate study program conforms with international standards.

The Programme's core mission is the effective professional development of scientists, engineers and policy makers specialized in the science of catalysis and especially its contribution to environmental protection (anti-pollution) and the production of clean energy.

The Programme initially called Catalysis and Environmental Protection ("K.P.P.") started in 2002 and it is one of the older PSPs offered. It targets mature students who will implement the findings of their studies into their everyday work.

The Programme which has evolved into one on Environmental Catalysis for Pollution Abatement and Clean Energy Production (ECPACEP) presented the EEAP with documents that clearly and comprehensively elaborate the suitability of the structure and organisation of the PSP. The materials presented to the EEAP also verified the sound form and function of the curriculum and the PSP overall. The curriculum design provides critical elements for competent professionals primarily in the petrochemical sector and other industrial settings but also progressively in other areas such as in regulatory organisations and in education.

b) the pursuit of learning outcomes and qualifications in accordance with the European and National Qualifications Framework for Higher Education - level 7

The Hellenic Open University (HOU) follows the European Credit Transfer and Accumulation System (ECTS) which is based on the principle of transparency in learning, and on specific teaching and assessment processes (ECTS Guide). One of the key features of the ECTS system is the mapping of the level of knowledge, skills and competences that are acquired by the student upon completion of the educational process and verified after evaluation (Annex A of HQA). This is achieved by writing learning outcomes which are attributed to individual Thematic Units and to the Programme of Study as a whole (Course Outline Form). The writing of learning outcomes is measurable and states what skills the students are expected to possess when they complete successfully a Thematic Unit or the entire Curriculum. The HOU follows the Bloom & Krathwohl (1956) classification to create the learning outcomes, as grouped into the following categories: knowledge, understanding, implementation, analysis, synthesis, and evaluation (Annex B of HQA).

c) the promotion of the quality and effectiveness of teaching at the PSP

In order to support the learning and teaching process, HOU has officially proceeded to the establishment and operation of the "Teaching and Learning Support Office" (with the acronym GRADIM in Greek and "Centre for Teaching and Learning," CTL in English). The CTL is a part of the Laboratory for Educational Material and Educational Methodology, which is an independent unit of the HOU and functions as an assistant to the CTL.

To promote the quality and effectiveness of teaching the ECPACEP PSP has four strategic objectives: (1) monitoring and upgrading the quality, (2) widening the awareness regarding the PSP, (3) strengthening the Academic Development of the DEP and SEP Members, and (4) promoting the PSP interface with external organizations. The University assesses the quality of the educational process at the end of each semester through questionnaires. Surveys are anonymous, and allow students to provide appropriate feedback.

The PSP on ECPACEM offers a variety of Thematic Modules/Units for the theoretical training of students concerning catalysis with emphasis on fuels, as well as the application of catalysis in

some other areas related to environmental protection. A special emphasis is given to interdisciplinarity – students from all aspects of industrial sectors participate in the programme.

d) the appropriateness of the qualifications of the teaching staff for the PSP

The teaching staff for the PSP consists of highly qualified professionals with expertise in various fields related to catalysis - mostly chemists and chemical engineers. Several faculty members are actively engaged in research related to fuel catalysis and catalyst characterisation. This research orientation ensures that the teaching staff remain up-to-date with the latest developments in the field and can impart cutting-edge knowledge to students.

The qualifications of the teaching staff for the programme are highly appropriate for the PSP's objectives and target audience.

The teaching staff's qualifications contribute significantly to the programme's effectiveness in training educators who can make a positive impact on the improvement of operations in the industrial sector.

e) The drafting, implementation, and review of specific annual quality goals for the improvement of the PSP

The implementation and review of specific annual quality goals for the improvement of the PSP include the continuous monitoring and evaluation of the critical components in order to ensure it remains on the forefront of social/cultural change and demands of society. The operational structure of the programme includes learning outcomes that are research-based and data-driven and subsume the European and National Qualifications Framework for Higher Education. The specific annual quality goals include a focus on effective faculty development, and research and teaching calculated to result in well-prepared postgraduates ready to assume a variety of professional roles in many sectors not limited to industry but extending to entrepreneurship, government and teaching.

The Strategic Objectives for each axis of activity (1. Education, 2. Research, 3. Connection with society, 4. Internationalization, 5. University environment and 6. Quality Assurance) of the programme, are accompanied by more specific actions quantified by metrics. Some of the objectives of the PSP, as described in document A3 are:

- Increase the participation of students in the evaluation procedure
- Strengthen the presence of the PSP on the Internet
- Consolidate communications with Alumni

The quality goals presented by the personnel for the improvement of the PSP are consistent with the best practices in remote education and concomitant research agendas that are connected to cutting-edge scientific inquiry in the higher education sphere in Europe.

The EEAP observed that (1) the drafting, implementation, and review of specific annual quality goals are clearly outlined and include critical objectives and desired outcomes and (2) that the support of the members of the PSP assures: (a) the efficacy of the structure and organization, (b) the continual review of learning outcomes vis-a-vis desired competencies that conform with the European and National Qualifications Framework for Higher Education, (c) the continual review

and improvement of the quality and effectiveness of course delivery and instruction, and (d) appropriate faculty qualifications.

f) the level of demand for the graduates' qualifications in the labour market

The Programme is designed to cater to the needs of scientists, engineers and other practitioners on the role of catalysis on hydrocarbon and biological fuels and, to a much lesser degree, to other environmental issues. The Programme addresses primarily the industrial sector. The primary objectives of this Programme are to provide understanding of catalysis and its effects on fuel manufacturing.

The Programme consists of 4 modules (Thematic Units), in catalysis, catalytic surfaces, methods for environmental protection and clean energy production, plus a fifth module that is a thesis. These modules span across (minimum) two years although most students take much longer to complete the programme, mostly due to their full-time employment as well as family and social obligations. The Programme is well-structured and comprehensive. Its design aligns with the current needs and challenges in the field of catalysis for fuels.

g) The Quality of Support Services for the PSP

The HOU and the Programme have taken substantial measures to provide essential support services to their PSP students. These services encompass administrative support, access to libraries, and a student welfare office. Additionally, the wide array of support services, including scholarship and internship offices, underscores the institution's commitment to comprehensive student development.

The Programme provides comprehensive support services to PSP students. The emphasis on electronic resources in the library system aligns with contemporary educational needs, ensuring that students have immediate access to vital academic information. These findings reflect positively on the Programme's efforts to create an environment conducive to effective learning and student success. HOU has demonstrated a strong commitment to providing robust support services to its PSP students. The comprehensive suite of support services, including scholarship and internship offices, enriches the overall student experience. However, continuous efforts to enhance awareness and accessibility of these services among students could further improve the support system.

h) The Efficient Utilization of Financial Resources for the PSP

Regarding the efficient utilization of financial resources derived from tuition fees, the data provided by the HOU do not offer explicit insights into the utilization of these funds.

While the tuition fees for the PSP are clearly defined, there is a need for greater transparency regarding the utilization of these financial resources. Establishing and disclosing a tuition utilization plan would promote accountability and offer a clearer understanding of how funds contribute to the Programme's success. This step, coupled with ongoing assessment and refinement, can enhance the efficiency and impact of financial resource utilization within the PSP.

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)

The internal evaluation procedures carried out at the level of the Institution, Schools and Study Programs are the responsibility of the Internal Quality Assurance System (IQAS) of the HOU. The competent Units/Offices that collaborate and carry out actions for the operation of the HOU IQAS are:

1. The Internal Assessment Unit (IAU/ MEA)
2. The Office of Strategic Planning and Development
3. The Quality Assurance Unit of the HOU (QAU/MODIP).

The Internal Evaluation Group (IEG) obtains information to determine the level of quality of all aspects of the educational process. The main goal of this process is to contribute to the continuous quality upgrade of the services provided by the University. The current evaluation focuses on the instructors, the organization of the Thematic Units, the educational material, the logistical infrastructure, and the administrative services.

Beginning with the academic year 2016-2017, should a member of Collaborating Academic Personnel (SEP) receive a grade of evaluation by students in two consecutive teaching periods (annual or semester) below 3 out of 5, the contract for the next semester or year will not be renewed.

On the website of the Internal Evaluation Unit of the HOU (MEA – <http://meae.eap.gr/>) detailed information on the evaluation actions is available.

The assessment takes place in electronic form via the internet and then the data is fed into an algorithm to calculate the average level per target module. Both electronic assessment and reporting are ISO certified processes in the HOU's internal ISO certification system.

The main goal of MEA/IEU is to monitor and upgrade the quality of the services provided by the HOU through the work it carries out throughout the academic year. A key tool in achieving this goal is the evaluation by the students of the educational process and more specifically of the instructors, the thematic Units (TE), the educational material and the administrative services.

The implementation of this transparent internal evaluation process provides the possibility of collecting and recording difficulties as well as improvement proposals, resulting in the easy creation of a plan for future improvements. In this context, a first action plan has already been created. Statistical data collected by the Education and Student Registration departments and related to student performance, development, exams, teaching data and finally student demographic data, are also taken into account.

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

- The EEAP recommends that more permanent teaching staff are hired for the programme.
- The EEAP recommends that additional material be disseminated to the students including video lectures and video-recorded discussion sessions.

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).

Documentation

- *Senate decision for the establishment of the PSP*
- *PSP curriculum structure: courses, course categories, ECTS awarded, expected learning outcomes according to the EQF, internship, mobility opportunities*
- *Labour market data regarding the employment of graduates, international experience in a relevant scientific field*
- *PSP Student Guide*
- *Course and thesis outlines*
- *Teaching staff (name list including of areas of specialisation, its relation to the courses taught, employment relationship, and teaching assignment in hours as well as other teaching commitments in hours)*

Study Programme Compliance

I. Findings

The EEAP found that the HOU PSP in Environmental Catalysis for Pollution Abatement and Clean Energy Production (EPACEP) is following a well-defined procedure. The features outlined in the Study Guide (2022-2023) of the EPACEP Postgraduate Programme include the description and objectives of the organization of the programme - including its educational, scientific, and professional focus. The Programme is in Greek, and it is one of the oldest programmes of HOU. The programme is seriously undersubscribed. However, the interviewed participants expressed their enthusiasm for the programme at a level that was higher than anticipated. The conclusion drawn from this interview process is that the PSP is a “boutique” programme for those with strong interest in catalysis and particularly those who are employed in the fuel industry (refineries and the like). Under this premise the programme holds well. However, the name of the programme implies that the scope is greater and, in this light, the programme is in need of additional material and applications.

The Study Guide outlines in detail a clear path for student progression which includes the delivery and assessment methods of the curriculum, as well as its alignment with the European Credit Transfer System (ECTS). To obtain the Master’s degree, 120 credit units (ECTS) are required. The progression in the modules from the first through the last theme is clearly outlined. The curriculum is composed of 4 mandatory modules (20 ECTS each), that cover theory of catalysis, analysis and characterization of catalytic surfaces, pollution abatement operations and clean energy production. As stated above, the programme is highly fuel-focused, which would be perfect if that were the name of the PSP. Finally, the students need to do a thesis (40 ECTS weight). The thesis carries much heavier ECTS load than the courses and it seems to be closer to what would be expected in conventional M.Sc. studies. Based on the conducted interviews, in many cases it trains the students in laboratory operations. Typically, the laboratory operations are carried out in the host university of the SEP member.

Over and above the thesis, the linkage between teaching and research is achieved by integrating recent research findings into the modules taught by the faculty members, and by engaging the students through assignments, within the framework of the subjects taught.

Interviews with current students, alumni, and other stakeholders provided remarkably similar commentaries. The consensus is that the programme is very demanding and leads to students extending the duration of their studies in order to absorb the material. This is an attribute of a strong programme, but it is also considered a contributor to the declining number of students. The professors were praised and were considered outstanding and accommodating. The students pointed out that the exams are stressful, and the material requested is often too much to cover during the examination time.

II. Analysis

The EEAP finds that the subject module of study is appropriate and that it conforms with universally accepted standards for Education in Catalysis for Pollution Abatement and Clean Energy Production.

There is a procedure in place for periodic revisions of the Programme curriculum. The teaching staff are all committed to the continuous improvement of teaching. The EEAP assesses the

curriculum as one that provides the required skills for the specialisation of the students in their field.

The decline in the number of students is not sharp and, given the undersubscription in the programme may not be significant but it is a concern to all stakeholders and the EEAP. The consensus was that diluting the programme to bring more students is not an attractive option and this is shared by the EEAP. Recommendations for increasing the number of applicants include better advertising, an outreach campaign, choosing a more representative name for the programme, and tailoring at least part of the programme towards the public sector.

The popularity of the programme by all stakeholders interviewed was evident by the summary grade to the programme that varied between 8.7 to 9.3 Thus, the programme is considered successful.

Nonetheless, an extensive list of recommendations was offered to the EEAP, which are recorded here.

- Textbooks are old and in need of updating.
- List of books in Greek is needed.
- More examples of applications via animations or videos.
- More visits to industrial sites.
- Introduce virtual laboratory sessions to the programme.
- Procedures for selecting theses' topics are slow and lists of available professors for each topic are missing.
- The programme needs to be aligned to waste management.
- Those with not relevant background find the programme much more difficult and vice versa.
- Videos of GCM would be very useful.
- On occasion, the date of GCM for multiple themes appears to be the same.
- The examination process and the examination sites must be provided at the beginning of the thematic units and not later.
- There is need for more DEP members.

III. Conclusions

The EEAP concludes that the subject PSP amply considers both the needs of the students and the realities of the labour market.

This PSP is following a well-defined process which involves all appropriate approval committees, the objectives, and the intended professional qualifications.

The program is successful but there is room for continuous improvement in several areas as discussed in the analysis and the recommendations.

Panel Judgement

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

Panel Recommendations

- It is recommended that the PSP study materials be updated and modernised. More practical exercises need to be incorporated. The students need to have more illustrative examples and visits to industrial sites.
- A stronger commitment to current cutting-edge topics like clean energy and wastes (including CO₂) as resources.
- Introduction of virtual laboratories in the programme would improve the quality of training.
- The mechanism of pairing students and professors for their theses appears to be in need of improvement. It is recommended that the list of available professors that can act as mentors be posted a priori.
- Consider adding select lecture sessions (in addition to Group Counselling Meetings) for the students to better absorb the material and midterm exams to spread the evaluation requirements over the year.

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.*

Documentation

- *Sample of a fully completed questionnaire for the evaluation of the PSP by the students*
- *Regulations for dealing with students' complaints and appeals*
- *Regulation for the function of academic advisor*
- *Reference to the teaching modes and assessment methods*

Study Programme Compliance

I. Findings

The Environmental Catalysis for Pollution Abatement and Clean Energy Production (KPP) PSP is delivered in its entirety online. The faculty (12; 1 DEP and 11 SEP) supporting the students in their efforts to assimilate the course materials do not hold lecture sessions which present the material

for each lesson to the students. They hold Group Counselling Meetings (GCM) online with relatively small groups of students (4 student groups, averaging 17 students per group in AY 2022-2023 for this PSP) five times per academic year (or three times per semester), for four hours each time, during which they answer students' questions, clarify concepts with which students have difficulty, and the like. During those periods, they also employ the "flipped classroom" approach by subdividing the group into smaller groups for open discussions of the concepts among themselves, with the instructor present. Faculty further promote student learning by making themselves available for consultation via email, text messages, and telephone. As it would be expected, such interactions between each student and his/her assigned faculty counsellor become more frequent and extensive throughout the period from the student's thesis topic selection and its completion.

Therefore, the students receive advice and guidance from the faculty but, ultimately, they are free to choose whichever learning path works best for each one of them, simultaneously developing their individual skills and sharing with their classmates, and thus becoming, de facto, active partners in the entire teaching/learning process.

All of the interactions described above suggest that indeed this PSP is delivered in a student-centred environment that promotes mutual respect. Since this PSP is delivered online, the mode of its delivery is set a priori.

The students are informed in advance of all assessment criteria and methods. For semester-long courses, 30% of their grade is based on their performance in two to four (typically three) written reports, and 70% on their final examination. For AY-long courses, four to six written projects (typically five) are assigned and graded.

The faculty frequently reminds and encourages the students throughout each semester to complete the student satisfaction surveys. This is done electronically at the end of each semester. For the AY 2022-2023, approximately 50% of the students completed these surveys for this PSP. On a scale of 1-5, the students awarded their faculty counsellors an average of 4.0/5, judged the quality of the PSP administrative services as 4.4/5, and the quality of the course materials 4.0/5.

There is also a well-established and clearly-publicised formal procedure for student appeals/complaints. A complaint form is available online.

II. Analysis

The EEAP finds that the subject PSP is well organised and employs methods of instruction which are appropriate for a programme which is delivered in its entirety online. During the meetings held with students, graduates, and employers/social partners of this programme (some of whom are also graduates), the EEAP was well impressed with the near-unanimous satisfaction of all interviewed concerning the competence and the attention and encouragement they received from the faculty throughout their studies at HOU. Also, they expressed their satisfaction with both the existing supporting infrastructure and the administrative services network at all levels – the HOU, the School, and the Programme.

The feedback from students via online questionnaires completed near the end of each semester is carefully considered and, whenever feasible, their opinions and suggestions are utilised toward the continuous improvement of this programme.

III. Conclusions

In conclusion, the EEAP finds that this PSP is of high quality and utility, that the teaching staff are competent and dedicated to supporting the students, and that the programme is well organised to deliver high quality online instruction, involves the students as they learn, and uses the students' feedback for its continuous improvement.

The EEAP's judgement is that this PSP fully complies with Principle 3.

Panel Judgement

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

Panel Recommendations

The EEAP recommends that the number of online sessions be increased to better assist students with their questions and comprehension of the learning materials and that they be videotaped and made available to students asynchronously.

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.

Documentation

- *Internal regulation for the operation of the Postgraduate Study Programme*
- *Research Ethics Regulation*
- *Regulation of studies, internship, mobility, and student assignments*
- *Degree certificate template*

Study Programme Compliance

I. Findings

HOU supports all incoming students through a series of emails with basic instructions followed by phone calls by the Faculty-Counsellors with the students. Shortly thereafter, typically during the second week, the Programme organizes several online meetings, during which new students are informed about the services offered by the University in general and, in particular, about the organization and functioning of their study Programme.

The conventional role of professor-teacher is transformed at HOU into that of a professor-counsellor, since his/her goal is to help and encourage the students on issues related to their way of studying, as well as helping them comprehend concepts with which they are having difficulties.

All professors at the HOU are trained through special seminars on online teaching to ensure their familiarity with this specific educational system. The EEAP learned that faculty members are eager to help students, and that they make themselves available by providing students with their email addresses, text and phone numbers. This was also confirmed by the students and alumni interviewed by the EEAP.

The Programme publishes a complete Study Guide annually - it is available on the web in both Greek and English. Also, this PSP has established a wide network of collaboration with a number of external institutions and social partners.

The study programme includes the completion of a Thesis. Before the topic and the three-member faculty committee are established, the students must submit a research proposal. The

PSP provides a Thesis Handbook and a set of quality requirements for its implementation. Each thesis' defence is online and open to the public.

The progress of students is monitored continuously. The structure of each course includes a study timeline, as well as a number of graded projects, typically three (3) for semester-long courses and five (5) for AY-long courses, which are completed and graded prior to the final examination. The average of the grades earned in these projects by each student account for 30% of his final grade for the course with the remainder 70% coming from the final examination.

Opportunities for student mobility are well publicized and allow interested/selected students opportunities for conducting a portion of their studies abroad with full transfer of earned credits (ECTS). As an example, students can request participation in the programme ERASMUS+, which HOU joined in 2004.

Upon completion of all PSP requirements, each student is automatically issued a Diploma Supplement in both Greek and English.

II. Analysis

The ECPACEP PSP at the HOU has organized and follows a well-established process for registering students, and facilitating and continuously monitoring their progress through graduation from this study program.

Great care has been taken to assist students in all aspects of their course of study in order to be successful in their completing this demanding PSP.

The great majority of students, alumni, and employers/social partners with whom the EEAP met during this virtual accreditation visit were highly complementary of the caring support they received throughout the entire course of their study from all HOU governing and administrative levels, and especially from their Professor–Counsellors.

III. Conclusions

The EEAP concludes that all procedures concerning students' admission, progression, recognition, and certification are thoughtfully prepared, founded on relevant laws and regulations, and effectively communicated to the students.

Therefore, the EEAP concludes that this PSP is in full compliance with Principle 4

Panel Judgement

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

Panel Recommendations

None.

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, selfassessment, training, etc.); develop policies to attract highly qualified academic staff.

Documentation

- *Procedures and criteria for teaching staff recruitment*
- *Employment regulations or contracts, and obligations of the teaching staff*
- *Policy for staff support and development*
- *Individual performance of the teaching staff in scientific-research and teaching work, based on internationally recognised systems of scientific evaluation (e.g. Google Scholar, Scopus, etc.)*
- *List of teaching staff including subject areas, employment relationship, Institution of origin, Department of origin*

Study Programme Compliance

I. Findings

At present, the Teaching Staff of the Environmental Catalysis for Pollution Abatement and Clean Energy (ex-KPP) PSP consist of one (1) Teaching Research Staff (DEP) of the Institution and ten (10) Collaborating Teaching Staff (SEP) from other Institutions. The SEP staff are appointed for a certain period of time.

For the selection and development of faculty members, the applicable provisions of the relevant laws and regulations are always applied. For the selection of SEP members, the Institution announces - every three years - positions for annual employment as a SEP member with the possibility of renewal for an additional three consecutive years. In the announcement, prospective members are invited to fill out an application listing their teaching, research and professional experience. The HOU does not have autonomy in opening new positions. Funding is controlled by the Ministry of Education. The HOU takes all necessary steps to fill new positions with highly qualified staff in order to meet both the teaching and research needs of the programme.

At present, there is no system in place for estimating the teaching workload in this online PSP. The faculty workload includes:

- Group Counselling Meetings (GCM) with students for discussion/guidance regarding the course instructional materials (at a minimum 5 sessions per academic year with a duration of 4 hours each).
- Communications with students outside the GCM for resolving questions.
- Preparation of assignments.
- Correction of assignments and personalised feedback to each student.
- Communication with students outside the GCM for resolving questions, as part of the systematic support and encouragement provided to a section of about 20-24 students.
- Supporting students in the preparation of assignments and throughout their study schedule (32 weeks).

The evaluation of the teaching staff by the students is performed near the end of each semester. Students are encouraged by the faculty to participate. They do so by completing a questionnaire online. The electronic system fully ensures the anonymity of the participants. For evaluation of the teaching staff, the main axes are:

- Faculty's assessment during the Group Counselling Meetings (GCM).
- Faculty's assessment of communication outside GCM.
- Faculty's assessment of the correction of written assignments.

The EEAP learned that this PSP strongly encourages both the linking of teaching with research and the mobility of the teaching staff. The strategic planning of the Institution addresses the professional development and the mobility of the members of the academic unit and facilitates the linking of research and teaching.

Specifically, the academic development strategy seeks academic staff who can enrich the existing Schools with new knowledge subjects, and pursues a strategy of continuous training of the academic staff in the utilisation of innovative educational methodologies and technologies.

The Foundation motivates faculty mobility and the conduct of original research:

- By allocating an annual grant per faculty member for participation in scientific conferences of €1,000 for a National Conference, and €2,000 for an International Conference, and
 - By financing of research proposals of the HOU faculty members for a period of 3 years. The amount of available funding amounts to €20,000 for each faculty member per year, i.e., a total funding per research project of up to €60,000 for the three years.
- A prerequisite for this award is the participation in the Project Team of a Scholar, who can be either a PhD Candidate or a Postdoctoral Fellow.

II. Analysis

The EEAP reviewed and considered all documents submitted on file, including the updated documents and presentations made during this virtual accreditation visit and considered the discussions with HOU leadership and the Teaching Staff regarding the processes in place for staff recruitment, training, as well as the existing supporting strategies for the advancement of the scientific work of the faculty. It also took into consideration discussions held with students, graduates, and employers of graduates and social partners of the PSP on the linkage between teaching and research. The EEAP found that the HOU, the School, and the Programme provide a supportive environment that promotes the advancement of the faculty's scientific work. Also, they apply appropriate, fair, and transparent practices for the recruitment and development of the faculty.

III. Conclusions

The EEAP found that this PSP has recruited high quality Teaching Staff who, with almost no exception, were highly praised by the great majority of current students, alumni, and employers/social partners interviewed. The existing HOU processes for the recruitment of faculty are judged fair and transparent and in line with National Laws and Regulations.

The program faculty are performing well at both the National and International scientific research domains and integrate current, cutting-edge research results into their teaching, as appropriate.

The EEAP has identified a clear and urgent need for additional DEP positions. The current allocation of DEP per PSP appears to be one (1), supported by a much larger number of SEP. The EEAP recognises this critical shortage of DEP positions, keeping in mind that these online PSPs offered by the HOU represent a unique vehicle for many students to realise their postgraduate ambitions.

In conclusion, the EEAP finds that the HOU's ECPACEP PSP is Fully Compliant with Principle 5.

Panel Judgement

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

Panel Recommendations

The EEAP recommends that every effort be made to secure approval from the appropriate Authority(ies) at the earliest opportunity for increasing the number of DEP Teaching Staff.

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 longterm 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.

Documentation

- *Detailed description of the infrastructure and services made available by the Institution to the academic unit for the PSP, to support learning and academic activity (human resources, infrastructure, services, etc.) and the corresponding firm commitment of the Institution to financially cover these infrastructure-services from state or other resources*
- *Administrative support staff of the PSP (job descriptions, qualifications and responsibilities)*
- *Informative / promotional material given to students with reference to the available services*
- *Tuition utilisation plan (if applicable)*

Study Programme Compliance

I. Findings

As is true for most PSPs of HOU, the teaching infrastructure and the services available for learning and student support are mostly centralized and HOU's educational offer is horizontal. Thus, the PSP on ECPACEP makes use of HOU's central Digital Library and Information Centre to fulfil the academic needs of the postgraduate students. The HOU library consists of both electronic and print resources, including ample access to textbooks, e-books, digital journals, theses, videos, thematic gateways and extensive databases, in line with current academic and professional practices for rapid, complete and legitimate (e.g., full-text upon subscription and Open Access) data retrieval. Additionally, the institutional administration provides physical library spaces and reading rooms that are open both to students and the academic community. Both current students and PSP alumni stated their entire satisfaction with regard to the ease and comprehensive access to the Digital Library, databases, and IT infrastructure. Furthermore, both current and former students emphasized the ease and frequency of their interaction with their instructors for deeper comprehension of the educational material, in addition to the regularly scheduled Group Counselling Meetings (GCM/OΣΣ). Helpful instructions for a smooth access of

both online and physical resources are available on the PSP's website, in addition to the comprehensive Study Guide.

Further to digitally operated processes for registration, exams, study plans, regulations, procedures etc. that are offered quite efficiently through various means (e-class, programme website etc.), students have easy access to a range of valuable specialised services. These include, but are not limited to, mobility programmes like Erasmus+, career guidance, counselling, scholarships based on excellence or financial needs etc. Among the latter, we note HOU's independent office of the "Student Advocate" which mediates between students and professors or administrative services, the Centre for Teaching and Learning (CTL), the Office of Equity and Inclusion as well as the Career and Alumni Office.

In addition to all the above services, Collaborating Faculty members act as academic advisors offering highly appreciated and personalised attention to help students with guidance and advice towards the successful progression and completion of their studies.

HOU's financial resources (regular State budget and public investment programme, funding from EU, international and transnational programmes, income from research and consulting services to third parties, income from property and other assets, tuition fees) appear to be adequate overall.

II. Analysis

The EEAP was given the possibility to assess several of these resources, including access to the Digital Education Space (<https://study.eap.gr>) of HOU. This allowed the panel to examine the educational content of the PSP's Thematic Units and confirmed the programme's capacity to offer the PSP students a wide range of services and support.

On several occasions, students expressed the need for a more regular updating of the content of some of the teaching resources (mainly textbooks). Furthermore, a desire for asynchronous teaching material, including recorded Group Counselling Meetings and other video content based on live teacher-student interactions was noted.

While the number of instructors is, overall, adequate to ensure the scope and quality of the ECPACEP programme, the EEAP felt that the proportion between permanent HOU-affiliated Faculty Members and Collaborating Faculty Members from other Institutions is extremely low and the programme under consideration (as well as the other PSPs) can only benefit from a higher number of HOU professors.

Nonetheless, the highly professional organization and distribution of all the above-mentioned multifaceted material (print, electronic, network capabilities, etc.) and the offer of quality institutional services, including the collection of documents and dissemination of valuable information are, overall, commendable. Ditto for the abundant advice, counselling and constant help with instructional questions of the students that is offered by the programme instructors.

Worth noting is the provision of all these services both locally and remotely to the members of HOU's academic community but also to all persons who wish to make use of the material available.

Although the financial resources are considered adequate, a possible support from the private sector, for instance in the form of participation to the tuition fees enabling company employees to enrol in the PSP could boost the attractiveness of the programme and the institution.

III. Conclusions

In conclusion, the EPACEP Programme is strongly committed to supporting its PSP students through a range of resources and services. The hallmark of distance learning, a key feature of HOU, is fully enabled by excellent and ample electronic resources in the Library and Information system which cover adequately the evolving needs of mature learners. The experience of specialized postgraduate studies in EPACEP is further enriched by a wide spectrum of support services, managed by dedicated administrative professionals.

Over the years, EPACEP has emerged as a unique PSP providing relevant skills to students in catalysis-dependent industrial settings and, progressively, in other rapidly expanding professional roles

Panel Judgement

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

Panel Recommendations

- The content of a number of teaching resources must be updated more regularly, especially in emerging areas like clean energy, and within reasonably short time frames.
- More asynchronous teaching material, such as recorded Group Counselling Meetings, videos of good professional practices and other audio-visual content based on live teacher-student interactions and Quality Management applications should become available to the students.
- Financial resources should be allocated by the State to hire more professors permanently affiliated with HOU to further benefit the EPACEP programme.
- A further infusion of financial support could originate from the private sector offering a substantial percentage of tuition fees for their employees enrolled in the EPACEP programme, thus increasing HOU's resources by increasing enrolment in the PSP.

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.

Documentation

- *Report from the National Information System for Quality Assurance in Higher Education (NISQA) at the level of the Institution, the department, and the PSP*
- *Operation of an information management system for the collection of administrative data for the implementation of the PSP (Students' Record)*
- *Other tools and procedures designed to collect data on the academic and administrative functions of the academic unit and the PSP*

Study Programme Compliance

I. Findings

Data Collection Procedures

The Programme has implemented comprehensive protocols for the methodical gathering of data pertaining to several facets of its academic division. These procedures comprise a comprehensive range of information pertaining to the student body, instructional methodologies, student advancement, employability prospects, and the professional trajectories pursued by graduates. Data collection is conducted at several levels within the Programme in order to provide complete coverage.

Information Systems and Collection Methods

The Programme employs a profusion of information systems and methodologies to effectively gather data. These resources encompass computerised databases, surveys, academic records, and engagement with pertinent departments and stakeholders. The Programme utilises a methodology that relies on data analysis to collect precise and current information.

Student Satisfaction Surveys

The inclusion of regular student satisfaction surveys is an essential element in the Programme's data-collecting endeavours. The surveys offer significant insights into the experiences, problems, and recommendations for enhancement as expressed by students. These periodic surveys are done on a semester basis to capture the changing opinions and expectations.

II. Analysis

The Programme exhibits a dedication to efficiently use the information acquired from satisfaction surveys. The acquired data are subjected to a systematic analysis in order to find patterns, areas that need improvement, and sectors that exhibit strength. The results are effectively conveyed to pertinent stakeholders, hence promoting transparency and accountability. Significantly, the data are utilised proactively to facilitate enhancements in diverse facets of the academic unit, encompassing pedagogical approaches, assistance provisions, and availability of resources.

The Programme continuously conducts analysis and evaluation of data pertaining to the availability and accessibility of various resources, such as infrastructure, social services, and IT facilities. This study facilitates the identification of any shortcomings or areas that require improvement. The purpose of this measure is to guarantee that resources are in accordance with the changing requirements of both the student population and the academic programmes provided.

The Programme demonstrates exceptional proficiency in properly displaying acquired data. The Programme utilises visual depictions that illustrate patterns and facilitate immediate analysis and comparisons. Graphs, charts, and visual aids are employed to enhance the accessibility and practicality of data for decision-makers, therefore facilitating transparency and fostering well-informed decision-making.

III. Conclusions

In summary, the Programme has implemented effective protocols for the methodical acquisition of data, including several facets of its academic dimension, such as the student population, instructional approaches, student advancement, job prospects, and professional trajectories of alumni. The Programme employs a plethora of information technologies and methodologies to guarantee the precision and comprehensiveness of data acquisition.

Student satisfaction surveys are of great importance in obtaining comments and expectations from students. The Programme efficiently utilises the data acquired from these surveys to identify areas that require enhancement, successfully communicates the results to pertinent stakeholders, and actively makes changes to improve the student experience.

In addition, the Programme continuously assesses the availability and accessibility of resources, ensuring that these resources are in line with the changing demands of the academic community. The collected data are displayed in a clear and visually instructive manner, which aids in making informed decisions and promoting openness.

The Programme demonstrates a strong dedication to making decisions based on data and pursues continuous improvement. This commitment is apparent via its thorough procedures for collecting data, efficient use of survey data, and clear presentation of findings. These collaborative endeavours contribute to the overall objective of the Programme, which is to offer students a high-quality educational experience.

Panel Judgement

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

Panel Recommendations

- The EEAP recommends examining more strategies for enhancing the rate of student response to instructor evaluations.
- The EEAP recommends that the HOU be encouraged to promote its activities including its presence on social media throughout its website, in order to achieve targeted advertising of the programmes and to attract new enthusiastic students.
- The EEAP recommends that the HOU be encouraged to create strengthened relations with its alumni. Since the programme has distinguished graduates and established professionals in the field, the need for the proposed action is imperative in order to highlight the strength of the ECPACEP programme to future graduates as well as potential students.

**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.

Documentation

- *Dedicated segment on the website of the department for the promotion of the PSP*
- *Bilingual version of the PSP website with complete, clear and objective information*
- *Provision for website maintenance and updating*

Study Programme Compliance

I. Findings

Availability of Key Information

The pertinent details regarding the Institution (HOU), the School (Science and Technology) and the PSP (ECPACEP) are readily accessible through internet sources. This information encompasses several aspects of the programme, such as its organizational framework, method of participation, criteria for evaluation, the degree conferred upon completion, and the curriculum vitae of the instructional personnel. The language used for dissemination of this wide-ranging information is Greek while its coverage in English is evolving and expected to be completed shortly.

Dedicated Website Segment

The Programme's website has a specific area that serves the purpose of offering a complete overview of relevant information for prospective students and other individuals who are interested in the subject matter.

Availability of Course Outlines

The course outlines for the PSP can be accessed through online platforms. The provided outlines present a comprehensive summary of the curriculum of the programme, with extensive explanations of the courses, their respective learning objectives, and the techniques employed for assessing student performance. They represent a significant asset for both current and potential students.

Policy for Quality Assurance

The Policy for Quality Assurance of the Programme may be accessed online on the website of the PSP. This policy delineates the approaches implemented to guarantee the programme's quality and efficacy. The quality assurance unit inside the Institution is referred to as MODIP and that inside the Programme as MEA. The establishment of this mechanism was initiated as a means of conducting ongoing assessments of its teaching and research activities, as well as its overall operational efficiency and effectiveness. The primary objective of this initiative is to ensure and

improve the quality of these elements, in accordance with international benchmarks and the criteria established by the Hellenic Authority for Quality Assurance and Accreditation in Higher Education (HQA). The responsibilities of MODIP encompass offering guidance to the university's administration and facilitating the development of policies and processes that support Quality Assurance and effective Evaluation, in alignment with the current institutional structure.

Clarity and Accessibility of Information

The material disseminated on the official website of the PSP is generally current, clear, and readily available. The provision of accessibility is of utmost importance for prospective students who depend on precise and up-to-date information in order to make well-informed choices regarding their academic endeavours. Similarly, multiple additional channels of communication contribute to its accessibility and dissemination to the wider public, including social media, web radio and monthly newsletter.

II. Analysis

Although current internet access to essential information is considered adequate, there is potential for enhancing the availability of this information in several languages in order to augment accessibility and appeal to a broader range of foreign students. Nevertheless, it is widely acknowledged that English serves as the predominant language of teaching in higher education.

The inclusion of a specialized section on the website aimed at promoting the PSP displays a strong dedication to fostering openness and facilitating effective communication. It is important to effectively engage prospective students and furnish them with a thorough comprehension of the programme's contents.

The online accessibility of course outlines is seen as a favourable attribute, since it facilitates students' comprehension of the programme's framework and subject matter. These outlines are a significant resource for students and instructors alike since they promote openness in the learning process.

The dedication to upholding high educational standards is exemplified by the accessibility of the Policy for Quality Assurance on the institutional website (PSP subdomain). The use of transparency fosters the development of confidence among students and stakeholders, therefore showcasing a strong commitment to the enhancement of programme quality.

Maintaining the currency of online content is vital in order to furnish reliable assistance to both prospective and current students. Regular maintenance and updates are important in order to accurately reflect any modifications in programme offerings, faculty composition, or policy. The Programme committee conducts continuous website updating and ensures alignment with the perspectives of students and alumni.

III. Conclusions

In summary, the University and the School overseeing the PSP have demonstrated praiseworthy endeavours in ensuring convenient online accessibility of essential information. The inclusion of a dedicated website section specifically designed for programme dissemination, comprehensive course summaries, and easily available regulations pertaining to quality assurance demonstrates a strong dedication to fostering openness and accountability.

In general, the initiatives undertaken by the Programme to offer easily understandable, thorough, and readily available online material have a favourable impact on the programme's standing and attractiveness to potential students.

Panel Judgement

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

Panel Recommendations

- The EEAP recommends that HOU must include the link to the existing alumni website in the ECPACEP website (<https://alumni.eap.gr/>), thus allowing prospective students to directly access and track the professional trajectories of former graduates. This integration will facilitate communication between current students and alumni, enabling the former to seek guidance and information from the latter.
- It is imperative for the ECPACEP programme to establish direct channels of communication with enterprises and employers.
- It is essential to ensure that students have access to comprehensive information regarding career pathways and opportunities.
- The EEAP recommends that the HOU be encouraged to promote further and more proactively its activities, including its presence on social media throughout its website, in order to achieve targeted advertising of the programmes and to attract new enthusiastic students.
- In order to augment the accessibility of the programme, it is advisable for the PSP to contemplate broadening the dissemination of material in other languages, with a particular focus on catering to the needs of foreign students.
- It is imperative to prioritise the continuous updating of online material in order to guarantee the accuracy and relevance of the information provided.

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.*

Documentation

- *Procedure for the re-evaluation, redefinition and updating of the PSP curriculum*
- *Procedure for mitigating weaknesses and upgrading the structure of the PSP and the learning process*
- *Feedback processes concerning the strategy and quality goal setting of the PSP and relevant decision-making processes (students, external stakeholders)*
- *Results of the annual internal evaluation of the PSP by the Quality Assurance Unit (QAU), and the relevant minutes*

Study Programme Compliance

I. Findings

The EPACEP postgraduate programme is monitored and evaluated in accordance with well-structured and centrally streamlined processes within HOU. The internal evaluation procedures that take place at the level of the Institution, Schools and Study Programmes are based on the Internal Quality Assurance System of HOU, where there is smooth collaboration among the Internal Assessment Unit (IAU), the Office of Strategic Planning and Development and the Quality Assurance Unit of HOU (MODIP). The teaching faculty (ΟΔΠ) of the EPACEP programme makes use of the Internal Quality Assurance System, in order to ensure the PSP's compliance with the applicable regulations of HQA (ETHAAE), and its adequacy in terms of academic content and international standards. The self-assessment reports of the EPACEP are prepared annually on the MODIP platform. These are discussed and items are identified and agreed upon for improvement.

At the end of each spring semester the Programme starts the planning of the courses that will be offered in the next academic year. When the process is completed, the list is approved (together with the teaching assignments) by the Assembly.

II. Analysis

The objective of the internal evaluation process is to ensure the continuous improvement of the quality of the services provided at the level of the institution (HOU), the School (Science and Technology) and the PSP (ECPACEP). The annual internal evaluation of the School conducted by its OMEA is completed with the Annual Evaluation Report which includes a plethora of tables and aggregated data regarding all its programmes, hence also the ECPACEP PSP. Of particular interest for concrete interventions as needed is the information on educational and research activities, as well as on all other services that are offered in conjunction with the programme over one academic year (two winter and spring semesters).

The process for the revision of the PSP curriculum is clear and transparent. The update of the curriculum is designed and decided by the Study Programme Committee which consists of the PSP Director and the coordinators of the thematic units. Following approval by the School Dean's Office, the revised version of the PSP must be approved centrally by HOU's Governing Committee after which it is sent to the Ministry of Education and, with this formality, the new curriculum is published in the government gazette (ΦΕΚ). After this step, the PSP Director proceeds with inclusion of the updated information in the Study Guide of the programme and the Study Programme Committee suggests the most appropriate educational material (textbooks, e-books, etc) to the teaching material development office, which is responsible for its acquisition.

III. Conclusions

Procedures for regular monitoring, review, and revision of the ECPACEP study programme are firmly in place and they contribute to maintaining and continuously improving the content and quality of the educational offer. At the same time these systematic procedures help to establish an effective learning environment for mature students and to exceed their expectations as pointed out by the uniform satisfaction of current and former PSP participants and their enthusiasm for recommending the programme due to its uniqueness and perceived overall prestige. The evaluations by the students regarding the educational offer that are collected are regularly analysed and the programme is revised on the basis of these questionnaires.

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

In addition to the professors of the PSP and the students, an external body, possibly representing social partners and the wider economy, could be very useful in providing valuable and structured input for the maintenance of the programme's quality.

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.

Documentation

- *Progress report of the PSP in question, on the results from the utilisation of possible recommendations included in the External Evaluation Report of the Institution, and in the IQAS Accreditation Report, with relation to the postgraduate study programmes*

Study Programme Compliance

I. Findings

The external evaluation of the University was carried out from 27 June to 1 July 2016 and the final evaluation report was received on 20/07/2018. All of the recommendations were taken into account and were put to practice to an extent of 70%, as detailed in the Progress Report submitted to HAHE in March 2020 in the context of the accreditation of HOU's Internal Quality Assurance System. Furthermore, HOU has accepted the spirit of the recommendations articulated in the external evaluation report and has adopted a process of continuous quality improvement supported by concrete actions.

The external evaluation of the Internal Quality Assurance System (IQA) of the HOU was carried out from 23 to 28 November 2020. The external evaluation report was received on 3 March 2021 and the final finding of the report was that the IQA fully complies with the principles of the Quality Assurance Standard of HAHE and the Quality Assurance Principles of the European Higher Education Area (ESG 2015). The duration of the IQA accreditation was set for four years, from 11-02-2021 to 10-02-2025.

II. Analysis

A well-structured procedure has been put in place at HOU aiming at the implementation of external evaluation recommendations regarding the PMS examined.

After receiving the external evaluation and accreditation report of the PSP, MODIP in collaboration with the academic unit (PSP Director and Dean's Office) studies the External Evaluation and Accreditation Report to decide on the adoption of part or all of the recommendations of the EEAP and the preparation of the Action Plan.

The Action Plan, which is approved by the Dean's Office of the Faculty of PMS, records the actions that will be carried out using the necessary resources and will contribute to achieving improvements and removing the weaknesses identified by the External Evaluation and Accreditation Report.

Upon approval by the Dean’s Office, the PSP Action plan is transmitted to MODIP for follow-up and implementation in view of the internal evaluation of the PSP. After two years from the date of accreditation, the academic unit (Programme Director, Dean's Office) evaluates the actions taken, the progress made during the implementation of the Action Plan and draws up the "Results Monitoring" Table. This table records the results achieved, the degree of achievement of the results as well as the actions taken to comply with the recommendations of the external assessment and accreditation. The finalized Monitoring Report is sent to HAHE by MODIP and published on HOU’s website, as an accompanying document of the PSP External Evaluation and Accreditation Report.

III. Conclusions

In summary, the ESPQCEP Postgraduate Studies Programme, in the context of well-established practices within HOU, follows an efficient process of external evaluation aiming at its accreditation. Judging from the institutional actions following the University’s external evaluation as well as from this EEAP’s discussions with the QMT PSP faculty and stakeholders, it is clear that the latter are taking the external reviews seriously and are determined to follow the recommendations to constantly improve the quality and appeal of the QMT programme.

Panel Judgement

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

Panel Recommendations

None.

PART C: CONCLUSIONS

I. Features of Good Practice

- The EPACEP Programme is well-structured and comprehensive. Its design aligns with the current needs and challenges in environmental catalysis and sustainable energy production.
- The professors are outstanding practitioners in their disciplines, are highly praised as teachers and are appreciated for their guidance and helpfulness.
- The Programme provides a wide range of support services of high quality to its PSP students, including administrative support, access to libraries, a student welfare office, scholarship and internship offices and many others, in line with HOU's commitment to comprehensive student development and modern distance learning.

II. Areas of Weakness

- The low number of students enrolled in the programme is of concern to the EEAP.
- The mechanism of pairing students and professors for their theses appears to be in need of improvement.
- The number of permanent faculty members (DEP) of the programme is very low.
- The programme appears to be in need of a more representative name.
- The student participation in mobility programmes is low.

III. Recommendations for Follow-up Actions

- The EEAP recommends that more permanent teaching staff (DEP) are hired for the programme.
- The EEAP recommends that more electronic material dissemination is offered to the students including video-lectures and video-recorded discussion sessions, plus increasing the number of online sessions (videos of GCM, virtual laboratory sessions, etc.) to better assist students with their questions and comprehension of the learning materials.
- The EEAP recommends that the PSP study materials be more regularly updated and modernized within shorter time frames. More practical exercises and illustrative examples of applications via animations or videos need to be incorporated together with more visits to industrial sites.
- The programme needs to be aligned to waste management together with a stronger commitment to current cutting-edge topics like clean energy and wastes (including CO₂) as resources.
- To improve the pairing between students and professors for their theses, it is recommended that the list of available professors that can act as mentors be posted well in advance.

- The HOU should encourage the private sector to subsidize a substantial percentage of tuition fees for their employees enrolled in the ECPACEP programme, thus increasing HOU's resources by increasing enrolment in the PSP.
- The EEAP suggests that encouraging stronger representation of students and professional bodies in the design process of the ECPACEP postgraduate programme is crucial and that all the data should be accessible to both the teaching staff and the students.
- The EEAP encourages the HOU to create strengthened relations with its alumni of the ECPACEP programme, introduce better advertising, initiate an outreach campaign, establish direct channels of communication with enterprises and employers, and tailor at least part of the programme towards the public sector.
- The EEAP recommends the establishment of an external advisory body, possibly representing social partners and the wider economy, in order to provide valuable and structured input for the maintenance of the programme's quality.

IV. Summary & Overall Assessment

The Principles where full compliance has been achieved are: **1, 2, 3, 4, 5, 6, 7, 8, 9, and 10.**

The Principles where substantial compliance has been achieved are: **None.**

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

Signature

- 1. Professor Emeritus Spiros Agathos (Chair)**
Université Catholique de Louvain, Belgium
- 2. Professor Emeritus George Haritos**
The University of Akron, United States of America
- 3. Professor Apostolos Kantzas**
University of Calgary, Canada
- 4. Mr. Manolis Tabouratzis, PhD student**
University of the Aegean, Greece