



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
HELLENIC REPUBLIC



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Accreditation Report for the Postgraduate Study Programme of:

Data Science and Machine Learning

Department: Electrical and Computer Engineering

Institution: National Technical University of Athens

Date: 15/06/2025



Με τη συγχρηματοδότηση
της Ευρωπαϊκής Ένωσης



Πρόγραμμα
Ανθρώπινο Δυναμικό και
Κοινωνική Συνοχή



Report of the Panel appointed by the HAHE to undertake the review of
the Postgraduate Study Programme of **Data Science and Machine
Learning** of the **National Technical University of Athens** 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 Data Science and Machine Learning of the **National Technical University of Athens** comprised the following five (5) members, drawn from the HAHE Register, in accordance with Laws 4009/2011 & 4653/2020:

1. Kopsidas Konstantinos (Chair)
(Title, Name, Surname)
Energy Division, Department of Electrical & Electronic Engineering, The University of Manchester
(Institution of origin)
2. BANITSAS KONSTANTINOS
(Title, Name, Surname)
Department of Electronic and Electrical Engineering, Brunel University London
(Institution of origin)
3. KYRIAKOPOULOS NICHOLAS
(Title, Name, Surname)
The George Washington University
(Institution of origin)
4. MORFOULI PANAGIOTA (YOULA)
(Title, Name, Surname)
Institut Polytechnique de Grenoble (G-INP)
(Institution of origin)
5. Δελησταύρου Κωνσταντίνος
(Title, Name, Surname)
University of Macedonia
(Institution of origin)

II. Review Procedure and Documentation

Brief reference to the Panel preparation for the postgraduate study programme review, as well as to the documentation provided and considered by the Panel. Dates of the review, review, meetings held, and any additional information regarding the procedure, as appropriate.

The Hellenic Authority for Higher Education (HAHE) organised an online accreditation review of the Postgraduate Study Programme (PSP) in Data Science and Machine Learning of the National Technical University of Athens (NTUA). The meetings were held via a teleconference tool provided by the NTUA and a commercial tool set by HAHE for the briefing meeting of the External Evaluation and Accreditation Panel (EEAP). The EEAP received the Timetable of the Accreditation Review and additional materials beforehand, either via email or through the online platform provided by HAHE. The PSP had no prior External Evaluation Report as it was first offered in the academic year 2018 to 2019. During the introductory meeting, EEAP members discussed strategy and assigned tasks. Additional documentation and presentations were provided by the departmental staff during and after the meetings.

The review began on Tuesday, June 10th, with an introductory meeting among EEAP members, followed by teleconferences with the Director of the PSP, the Head of the Department, the Quality Assurance Unit of the NTUA, Steering Committee and Internal Evaluation Group (IEG) members of the PSP. On the same day, the online tour of the NTUA, and specifically the facilities utilised for the PSP (classrooms, lecture halls, libraries, laboratories, and other facilities related to the PSP), was conducted via a video that was reviewed by the EEAP ahead of the scheduled day. Discussions about the facilities continued throughout the day.

On Wednesday, June 11th, 2025, the committee met with teaching and laboratory staff, seven current students, a few graduates from the first years of the PSP's existence, external employers, academics, social partners, and stakeholders. EEAP had the opportunity to engage in discussions with academic and technical staff members from the PSP. The students were asked various questions about their academic life and shared their perspectives on the structure of the PSP, the challenges they encountered, and their experiences with the PSP of the NTUA. They also commented on their satisfaction with their study experience and the Departmental and Institutional facilities, as well as their input and contribution via feedback in quality assurance and aspects concerning their student life and welfare. The discussions with external stakeholders (mainly industry and academia) focused on their relationships with the PSP staff and students, the dissemination of activities, and bidirectional knowledge exchange. The next video conference meeting was held with several graduate students selected by the Programme. The focus of the EEAP was to identify the integration of graduate students into industry and their opportunities for further studies. The online accreditation visit concluded

with a debriefing that involved the leadership of the NTUA, the Director of the PSP, the Head of the Department, QAU, the PSP Steering Committee, and IEG members.

In the following days, the EEAP focused on key review findings. They appreciated the PSP's faculty, online hospitality and cooperation. From June 12th to June 17th, 2025, EEAP members worked independently and collaboratively on the Accreditation Report, with follow-up meetings held via a commercial tool provided by HAHE.

The report presents the collective findings of the Panel, based on the two-day meetings, the shared documentation provided by the PSP, private discussions that followed during the video conferences, and email communication with the QAU.

III. Postgraduate Study Programme Profile

Brief overview of the postgraduate study programme with reference to the following: history, academic remit, duration of studies, qualification awarded, employment opportunities, orientation challenges or any other key background information. Short description of the home Department and Institution, with reference to student population, campus or any other related facts.

The PSP in Data Science and Machine Learning, established in 2018 (as Documented in M2.3, M9.1, M10.1) by the School of Electrical and Computer Engineering of the National Technical University of Athens, is a three-semester 90 ECTS degree with 60 ECTS awarded for the successful completion of the courses and 30 ECTS awarded for the successful delivery and completion of the mandatory PSP Dissertation/Thesis. The PSP is structured with four (4) compulsory and two (2) elective courses, each one of 5 ECTS for each semester of the first year. There is a plethora (19) of elective courses a student can select based on their preference and the career path they want to follow.

The students who have successfully completed the three semesters of the PSP are awarded the Degree of “Diploma of Post-Graduate Studies in the field of Data Science and Machine Learning”. This Diploma of Post-Graduate Studies is effectively an equivalent postgraduate Master of Science (MSc) degree.

This PSP is an interdepartmental initiative that engages the academic involvement of several schools, including Electrical and Computer Engineering, Applied Mathematics and Physics, Civil Engineering, and Rural and Surveying Engineering. The 36 members of the PSP’s teaching staff (Document M2.5) consist of professors, laboratory and teaching personnel, and technical researchers with expertise in data science and machine learning. Each student is supervised by a professor during their thesis, which is evaluated by a three-member academic committee.

The programme is hosted at NTUA's main campus in Zografou, which is equipped with advanced lecture halls, computing laboratories, and high-performance computing infrastructure suitable for data-intensive tasks and machine learning projects. Students also have access to the central NTUA Library, which offers over 215,000 books, more than 100,000 journals, and rare historic scientific collections. In addition to classroom facilities, students benefit from proximity to cutting-edge research units such as the Institute of Communication and Computer Systems (ICCS), the Metsovion Interdisciplinary Research Center, and the Lavrion Technological and Cultural Park, which supports applied research and innovation projects (information gathered from the shared Video and NTUA and their library website).

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

I. Findings

The PSP Data Science and Machine Learning began its operations back in 2018 as part of the NTUA's multidisciplinary degrees. There were four departments collaborating in this PSP, namely the computer systems engineering, applied mathematics and physical sciences, surveyor and geoinformatics and civil engineering.

It comprises three semesters, two taught ones with six modules each, and one semester dedicated to the development of the dissertation. There is a large pool of optional modules that the student can choose from, especially during the second term. The total ECTS credits gained are 90 (60 for the taught part and an additional 30 for the dissertation).

Teaching is conducted face-to-face and the language of instruction is Greek. There is an option for occasional attendance by Erasmus+ students in certain modules, which are then offered in English. However, this is not clearly communicated on the website, as no English versions of the PSP or Student Guide are available. As a result, it is unclear how non-Greek speakers can access this information. The PSP does, however, allow for the thesis to be written and submitted in either Greek or English. There are no student fees for this PSP as these are covered by other means. This is of particular interest and will be further discussed below as it attracts many top-tier students.

There is a large number of applicants; about 220-260 per year. Through the initial screening, about 90 of those are interviewed and about 40 are accepted into the course annually. Most of the applicants come from computer science, mathematics, physics and economics. About 85% of applicants are graduating within the 3-semester period and on time.

The teaching staff are also of the highest calibre both nationally and internationally with outstanding research records and research impact.

In general, this is a well-designed and timely PSP that sits at the edge of current technology, fulfilling the need for creating specialised graduates with knowledge in artificial intelligence and machine learning. This is a sector that has seen unprecedented growth in the last few years with companies longing for personnel that can adequately fulfil these positions.

II. Analysis

As mentioned above, this PSP has run well since its creation and has produced some outstanding graduates who are very desirable in the industry. Nevertheless, there are some elements that can be improved. Primarily, the student internationalisation of the PSP is relatively low and definitely lower than it should be.

The absence of an established or systematic provision of the entire programme in English (with Greek being the primary language of instruction) presents a significant obstacle for international students considering enrolment.

It also seems to be an unfair advantage to students coming from NTUA itself; however the University seems to be happy keeping this unbalanced. This is partly mentioned in point 5 of the document M1.2 but sadly, it only touches upon the

external exposure of the teaching staff. In addition, the collaboration with external stakeholders and society in general also seems to be less than optimal. This is also mentioned in point 3 of document M1.2. However, during talks with the evaluation committee, it was stated that steps are already in place to address these shortcomings, including the establishment of an alumni office and consideration for an industry liaison panel that can also be incorporated into the strategic steering of the studies and module development.

Some of these strategic goals set within document M1.2 seem modest at least. One example is the improvement of the low scores coming as feedback from students: in goal 1.2 the target is set to increase from about 2.85 to 3.4 on average, in relation to the teaching methods. This seems like a low bar to set.

The information that was uploaded to the HAHE's website concerning this principle, seems to be very limited. It comprises two main elements. First, a very generic statement of quality assurance (about two pages) that does not seem to be dedicated to this PSP but rather reads like a generic statement applicable to any PSP around the world. Within, it states a general commitment that the PSP would be well managed, rather than including the ways that this will be achieved and the metrics to use when evaluating its effectiveness. The second is a set of strategic goals that are expected to be completed by the end of 2025. This is a challenging task, as many of these do not seem to have even started (some are mentioned above).

Other than the above two, most information related to Principle 1 is found scattered around the other documents, and especially the initial slide presentation made in the first meeting. It would be preferable for these data to be gathered within the official documents submitted to HAHE prior to the review and related to this principle. For this review, those are the M1, M1.1, and M1.2; however, this should not limit the PSP faculty to include more documents as required.

III. Conclusions

In general, the accreditation committee can clearly see a PSP of very high value, with excellent teaching staff, top-tier students and outstanding quality. However, it seems that the vast experience of the teaching staff allowed them to start and run this PSP without having had all the processes well documented and this is reflected in this principle as well. It appears to follow an approach of initiating the process without a fully developed implementation plan, i.e., "let's start it now and we will figure out the rest later". While this may have worked well so far, it can also leave the PSP exposed if things begin to get out of hand. That said, this is a typical pattern for most new programs, particularly those involving emerging or not yet clearly defined areas of technology. They often undergo course corrections as experience is gained. For instance, the use of the Academic Advisor has only just recently been incorporated in the PSP. Despite this, none of the students interviewed seem to know what this was about. This might leave the door open for appeals in future disputes as students will claim they were not helped sufficiently.

In conclusion, since this is a PSP with a strong basis in excellence, it would be only a matter of minor adjustments in strategy, to further improve it and elevate it to, possibly, one of the best in the country.

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

- 1.1. Revisit the quality assurance statement and include metrics on how these goals are to be ensured.
- 1.2. Consider enhancing the PSP's internationalisation by making it more attractive to international students (by increasing the visibility of the PSP abroad, offering more courses in English, highlighting unique aspects of the curriculum, or providing additional support services tailored to international student needs).
- 1.3. Increase involvement of external stakeholders and industrial partners into the steering of the PSP's content.

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 interviews and materials provided during the review process confirm the existence of a well-defined PSP curriculum structure and accompanying documentation, covering courses, course categories, ECTS credits, and expected learning outcomes aligned with the European Qualifications Framework (EQF). The PSP Study Guide, in particular, is comprehensive and includes all the core information required for students and prospective applicants. It outlines the programme structure, learning outcomes, regulations, and academic expectations in a clear and informative manner.

However, there are areas where the Study Guide could be further improved. Specifically, it does not provide details on whether students can convert from full-time to part-time status, or clarify if such a conversion is allowed. Likewise, it lacks information on the procedures for requesting an extension or interruption of studies under mitigating circumstances. Including these elements would enhance the transparency and completeness of the guidance provided.

While student progress and engagement data are consistently recorded, there is limited evidence of a systematic internal review process to ensure continuous improvement in key areas such as course and thesis outlines, internship and mobility opportunities, and the integration of student-centred learning approaches. Although the IEG and QAU minutes indicate that quality assurance practices occur periodically, discussions tend to focus on operational issues such as delivery modes and bibliographies, without strategic engagement in areas like long-term programme development, internationalisation, or online presence. Importantly, there is no clear evidence of structured participation by external stakeholders in the programme's review and development processes, despite their expressed willingness to contribute. Specifically, from the interviews with the industrial partners and academic experts, this seems to be an omission that requires rectification.

Lastly, no documentation was provided to demonstrate detailed internal decision-making processes, including task allocation among faculty or timelines for implementing QA actions. Although the Institution's QAU minutes suggest that some developmental steps are being taken, these are described in general terms and are not supported by a clear plan for execution, staff responsibilities, or deadlines. This lack of systematic documentation and communication limits the ability to share good practices among PSPs and hinders coordinated quality enhancement across the Institution.

II. Analysis

The design and approval of the PSP reflect a strong alignment with institutional goals, faculty strengths, and contemporary academic and industry trends. The programme structure and curriculum show thoughtful integration of learning outcomes, credit allocation, and progression expectations.

Nevertheless, the internal QA mechanisms supporting programme development and review lack the systematic documentation, stakeholder engagement, and process transparency expected under the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG 2015, Standard 1.2 & 1.9). For example, it is not possible to trace actions taken following external evaluations or stakeholder feedback, due to the absence of documented responsibilities, timelines, and action tracking. Similarly, although updates to the programme webpage and the development of an English version are reportedly underway, there are no formal records or follow-up plans available in the IEG or QAU documentation.

On ECTS implementation, while the programme follows the standard structure (1 ECTS = 25-30 hours of student effort; 60 ECTS per year), there is no evidence of systematic workload monitoring across student types (e.g., full-time, part-time, or those with interrupted studies). Data in Table E of M7.4 shows that not all students graduate within the standard timeframe and that extensions are sometimes granted, yet no guidance is provided on how students can request these extensions or deferrals.

Finally, the Student Guide does not specify the expected time commitment per course or dissertation (i.e., how many study hours a candidate is expected to dedicate to completion), a gap that limits its usefulness for student planning and contradicts the principle of workload transparency that underpins the ECTS system.

III. Conclusions

The PSP is underpinned by a well-structured curriculum and documentation aligned with EQF and ECTS frameworks. However, the QA processes related to programme design and approval are insufficiently formalised, with limited documentation of decisions, responsibilities, or stakeholder involvement. The Study Guide, while generally comprehensive, lacks important operational details on study mode flexibility, extensions, and student workload per unit, which should be addressed to enhance transparency and alignment with EHEA standards. Strengthening internal review procedures, clarifying student regulations, and engaging external stakeholders more systematically will support ongoing improvement and international credibility.

Panel Judgement

Principle 2: Design and approval of postgraduate study

programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

- 2.1. Strengthen the student guide with the inclusion of sections capturing practical and regulatory information
- 2.2. Integrate alumni tracking and stakeholder feedback mechanisms into QA systems with a more formal, systematic, and periodic approach.

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 external committee had the opportunity to review several documents related to the teaching and learning of this PSP. Additionally, there was an opportunity to speak with both current and past students, who shared their experiences in this subject.

The institute was kind enough to also share a very elaborate document containing the feedback acquired by the students in the form of questionnaires. This was a very detailed, 257-page, document that attempted to provide some insights into the view of the students as well as draw some conclusions based on the received opinions.

The student population that participated in these questionnaires was, unfortunately, very small (in this case, approximately 10% for the winter semester and 2.5% for the summer semester). The results of these questionnaires vary and will be discussed below.

Furthermore, there is evidence that there are procedures in place to support students. Specifically, some of the information coming from the students' feedback has been fed back to the steering committee of the PSP through the board of studies. The Academic Advisor role is established, and the duties of such tutors are documented. There is an advertised, University-wide procedure for student complaints that is also advertised on the NTUA web pages. There is ample support for the students throughout their studies from the teaching staff. This relates to all stages of their studies, including their dissertation.

Finally, the committee feels obligated to mention the high opinion that both current and past students have formed of this PSP, as evident by the live conversation between the committee and the students / graduates.

II. Analysis

Many of the processes mentioned above appear to have been standardised recently, and after the PSP began its operations. As an example, the PSP started in 2018, but it was only in 2023 that the role of the Academic Advisor was in place (discussed in 2020 but approved in 2023, document M3.3).

In that subject and through the discussion the committee had with students, it seemed that the students were not aware of either the existence of the personal tutor or the ways in which help and assistance could be provided through this process. This is rather disappointing, and it should be rectified, perhaps by including an introduction to their corresponding Academic Advisor during orientation week. With regards to the students' feedback through questionnaires, the obvious issue is the very low student participation. With only 2.5-10% of students answering these questionnaires, there cannot be any meaningful conclusions made as most feedback cannot be separated from statistical noise. This challenge is not unique to NTUA, as many universities face similar difficulties in securing high participation rates. In response, several institutions have introduced incentives (for example, gift cards or early access to results) to encourage student engagement. Nevertheless, dedicated efforts are still needed to significantly improve participation levels. Furthermore, it is unclear how student feedback drives changes to the PSP.

Ideally, (meaningful) feedback should be analysed and discussed in the board of studies and then changes to the module descriptors should be implemented on an annual basis to address any issues identified. In the feedback analysed in document M3.1, several shortcomings are identified by the students. Some are even picked up by the institution as well when pointing out the low score received in specific areas.

In general, the PSP appears to be running relatively smoothly, and the necessary support is provided to the students who, in turn, share their feedback with the teaching staff. However, this seems to be driven more by experience rather than established and documented procedures. This might leave the institution vulnerable to appeals.

III. **Conclusions**

This is a very desirable PSP that manages to encompass a great number of desirable characteristics: cutting edge subjects, excellent teaching staff and top tier students. The student participation in the steering of the PSP is there somehow, but it is not as evident as it should be, especially in the above-mentioned areas that received a lower score from the students.

Efforts should be made to increase the students' feedback through increased participation in the process and support through the use of personal tutors.

Panel Judgement

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

Panel Recommendations

3.1. Provide incentives for students to increase participation in filling out the course evaluation questionnaires.

3.2. Establish and inform the student of the role of the Academic Advisor and the ways that they can assist the student. It would be nice to include the Academic Advisor role in the student guide.

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

The PSP is the result of a cooperative arrangement of the School of Electrical and Computer Engineering with the Schools of Applied Mathematics and Physics, Civil Engineering and Rural and Surveying Engineering.

The regulations governing the operation of the PSP are listed in document M4.2 covering the audience to which the PSP is addressed, prerequisites and admission criteria, and a student guide describing the regulations governing the operation of the PSP available on the website (<https://dsml.ece.ntua.gr/>) of the programme. There are no detailed admission requirements beyond the possession of an undergraduate degree in a relevant scientific field. An Admissions Committee, comprising faculty from the cooperating Schools, evaluates the records of the applicants.

The Programme of Studies Committee has established the criteria for admission to the program; they are published on the PSP website. These include grade of the diploma, rank of the diploma grade within the issuing School and academic year, grades of the undergraduate courses in the subjects related to the graduate program, professional and research activities, evidence of some knowledge of a foreign language for Greek students (Greek for non-Greek students) and reference letters. The maximum number of admitted students is 40 per year, although, under specified circumstances the Programme of Studies Committee may admit some additional students. For the period of existence of the programme most of the enrollees have completed it successfully.

The courses are taught in Greek, with the possibility of some courses or parts of a course being taught in English upon approval by the Programme of Studies committee. This is a consequence of the fact that the primary focus of the PSP is domestic; it aims to address the needs of the Greek market. Detailed regulations governing class attendance (mandatory), examinations, grading and graduation requirements are published. Under exceptional circumstances provisions are in place for a class to be taught online. The Thesis may be written in Greek or English upon approval of the committee. In either case, a detailed summary in both languages is required. Procedures are also published for selecting outstanding Theses for special prizes. Authors may claim intellectual rights for their work described in the Theses where appropriate.

The duration of the PSP is three academic semesters with the duration of matriculation up to a maximum of two years. The regulations provide a detailed description of the scope and educational objectives of the Thesis including the procedures for undertaking and conducting the relevant research, rewarding prizes for excellence across the entire institution and providing mechanisms for securing intellectual property rights by the authors of the work. Upon completion of matriculation students are awarded the Diploma of Postgraduate Studies Interdepartmental National Technical University.

Research for the thesis may be conducted abroad in institutions associated with the Erasmus program, public and private sector entities and institutions of higher learning in Greece or abroad. The PSP provides flexibility for the students to

conduct research for the thesis topics in appropriate venues in the public and private sectors within the European Union.

II. Analysis

The PSP has been developed in response to the emerging global needs for the fields of data science and machine learning. It aims to enhance the knowledge of engineers and scientists in these two areas with the broad objective of producing future leaders knowledgeable in these emerging fields.

The PSP offers a collection of courses covering the principal areas one would associate with the broad area of Artificial Intelligence. It aims to provide the students with theoretical and practical knowledge for representing, storing and processing different types of data using modern algorithmic and computational techniques. A background in mathematics and statistics is needed to determine the selection of optimal sets of data for a given problem, as well as techniques and methodologies for analysing large volumes of data for the construction of models used in prediction and decision-making.

With the exception of the possession of an undergraduate degree in a scientific field, there are no published specialised prerequisites for entering the program. However, the regulations permit the transfer of credits for relevant courses from another programme of study upon approval by the relevant faculty in the program. The diverse professional background of the teaching staff exposes the students to a wide spectrum of perspectives on the topic of artificial intelligence.

It would be beneficial to include data on student deferrals, interruptions, and extension requests, as this would make the information provided (e.g. Table E in document M7.4) more complete and easier to interpret.

III. Conclusions

The PSP in Data Science and Machine Learning is a well-structured, interdepartmental programme tailored to current global demands in AI and data science. It offers clear regulations, flexible research opportunities, and a strong academic foundation. While admission criteria are broadly defined, the PSP ensures academic rigour through committee-based evaluations and comprehensive study regulations. Instruction is primarily in Greek, with limited English options. Overall, the PSP provides solid academic and administrative support, but could benefit from more specialised admission prerequisites and expanded English-language provisions.

The procedures for admitting students to the program, monitoring their progress and awarding the degree are clearly formulated and applied to ensure achievement of the educational objectives of the program.

It would have been helpful to include numbers reflecting students who defer, interrupt, or request extensions in the relevant tables, making them more complete and easier to understand.

Panel Judgement

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

Panel Recommendations

4.1. Establish a systematic procedure to record and report detailed student registration and progress data, including cases of deferrals, interruptions, and extensions, to ensure comprehensive and transparent monitoring of student trajectories.

PRINCIPLE 5: TEACHING STAFF OF POSTGRADUATE STUDY PROGRAMMES

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

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

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

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

The formal professional qualifications and criteria for selecting teaching and research staff are defined by law. The teaching staff is drawn from a pool comprising the teaching and research staff of the institution, Emeriti Professors, faculty from other units of the Institution or other institutions of Higher learning, and visiting faculty and researchers with specialised knowledge and expertise relevant to the subject areas covered by the program. The criteria include, inter alia, familiarity, knowledge, and experience in the subject area, research activities reported in international scientific journals and professional conferences.

In addition, the Institution uses various internationally recognised rankings to demonstrate the professional competence of the teaching and research staff associated with the program. The metrics comprise the number of courses,

undergraduate and graduate, taught per academic year, the number of publications in Conference Proceedings, the number of Journal articles, the number of references in Google Scholar and Scopus, and the H-index in Google Scholar. In addition, demonstration of professional qualifications includes special recognitions and rewards, Senior and Fellow positions in professional societies, editorships in professional journals and other activities recognised as demonstrative of professional qualifications.

The PSP provides for payment to the participating faculty from sources other than the government budget or the budget for national development. Faculty of the Institution who participate in the PSP on an overload basis may also be paid accordingly.

There are detailed regulations governing the obligations of the faculty participating in the program. These include adherence to the published programme of studies, monitoring student attendance, using the international technical literature to ensure that the contents of the course are current and relevant, emphasising the link between the theoretical and the practical aspects of the course contents, and developing and making available a course syllabus including relevant bibliography. The obligations of the faculty responsible for the PSP also include keeping published office hours, publication of a detailed syllabus, posting on the course website visual aids and other material used during the lecture and publishing the results of examinations promptly. Failure to adhere to these obligations can be used to deny the right to teach the course.

There is a published policy for the professional development of the personnel associated with the operation of the PSP (document M5.4). It includes encouragement of participation in cooperative research at the national and international level, guest lecturers from other domestic and foreign research and teaching institutions. The policy aims toward renewal of the subject matter covered by the program. It encourages collaboration with the faculty of universities and research centres in Europe and the US. The participation of the University in the European University EUList, and programs such as ERASMUS Staff Training, ERASMUS+, ERASMUS INTERNATIONAL, ERASMUS MUNDUS, European University Foundation and other international organisations, provides opportunities for the staff to keep abreast of and participate in current scientific and educational developments.

The faculty participating in the PSP are eligible for educational leave to engage in cooperative research activities with universities and research centres in Europe and the US.

Income derived from the Special Account for Research Funds is used to support scholarships for doctoral candidates, specialised equipment and support for basic research in new fields.

II. Analysis

The contents and procedures of the published policy regarding the qualifications of the teaching staff are commensurate with the requirements of the program.

The focus of the PSP is on the current developments in the field of artificial

intelligence, a relatively new area that aims to integrate topics from a number of diverse classical fields of science and engineering. The topics covered are directly related to the current topics of the research activities of the staff in the areas covered by the program. The teaching staff, approved by the Programme of Studies Committee, reflects the disciplines forming the core of the programme and the qualifications of the teaching staff are those that have been evaluated by their respective units of the university. As such, they are eminently qualified to teach in the program. No additional qualifications are required or needed.

Although the topics covered by the PSP are all relevant to the broad area of artificial intelligence, there is a lack of a research strategy with a focus on Artificial Intelligence as it is envisioned by the Programme of Studies Committee. One possible approach toward the formulation of such a strategy is to begin with a course that integrates the courses of the PSP under the “umbrella” of this new field called “artificial intelligence”. Such a course would help give the PSP a distinct identity and establish Artificial Intelligence as a distinct discipline as opposed to a collection of topics from different fields.

III. Conclusions

The contents of the PSP are directly related to the areas considered to fall under the purview of what is perceived as Artificial Intelligence and the professional qualifications of the teaching staff are appropriate for the program.

Panel Judgement

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

Panel Recommendations

5.1 Consider developing a course attempting to integrate the disciplines that fall under the umbrella of “Artificial Intelligence” into a distinct new discipline. It would be a challenging but potentially rewarding endeavour.

PRINCIPLE 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, CAREER AND SOCIAL POLICY SERVICES ETC.).

Institutions and their academic units must have sufficient resources and means, on a planned and long-term basis, to support learning and academic activity in general, so as to offer PSP students the best possible level of studies. The above means include facilities such as the necessary general and more specialised libraries and possibilities for access to electronic databases, study rooms, educational and scientific equipment, IT and communication services, support and counselling services.

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

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

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

According to document M6.1 and confirmed through discussions with students and graduates, a virtual tour, and online resources, the NTUA and the interdepartmental PSP in Data Science and Machine Learning is coordinated by the School of Electrical and Computer Engineering and supported by the Schools of Applied Mathematical and Physical Sciences, Rural, Surveying and Geoinformatics Engineering, and Civil Engineering to provide adequate infrastructure and student services.

These include the Research Ethics Committee, Gender Equality and Anti-Discrimination Committee, Student Social Welfare Support, Study and Career

Counselling, the NTUA Library and Information Centre, and the European Educational Programmes Office. Relevant laboratories include the Personal Computers Laboratory, the Statics and Earthquake Research Laboratory, and the Remote Sensing Laboratory.

Specifically for the PSP, the coordinating school offers several facilities, technical infrastructure, and services; Examples are (a) a teaching room or a room within the Personal Computers Laboratory, equipped with audiovisual apparatus, (b) an administrative workspace with full secretarial support by an officer (job description and qualifications in the document M6.5), (c) additional teaching, presentation, and laboratory spaces, (d) the Library of the School and the Central Library, (e) the PSP website (<https://dsml.ece.ntua.gr/>), (f) the e-learning platform (<https://helios.ntua.gr/>).

Students and graduates reported no issues with facilities or services and expressed satisfaction with the support provided. However, the PSP website lacks full English-language content. Announcements, services, and key documents such as the Study Guide, Quality Policy, and Complaints Management Regulation are currently available only in Greek. While not yet bilingual, staff indicated that English content is in development.

As stated in document M6.2, tuition is free for EU students, with a fee of €500 per semester for non-EU students. To date, the programme has only admitted Greek students, with occasional participation from Erasmus+ exchange students. Consequently, no tuition fee revenue has been collected. The PSP's estimated annual operating cost is €55,000 (2024–2029), currently covered entirely by institutional funding, with no external sources involved. Plans are underway to expand the programme's reach to international students and offer it in English or other languages through future partnerships.

According to document M10.1 and confirmed in meetings, Erasmus+ students may attend selected modules offered in English. The Erasmus office coordinates the process, informing instructors and obtaining consent from enrolled students. This process appears to function well, with some exchange students attending PSP modules. However, clear guidelines and documentation for prospective Erasmus+ participants are lacking.

From document M6.4, it is identified that teaching is carried out by research and lab staff, retired faculty, and qualified external scientists (all PhD holders). PhD students may assist with lab sessions and coursework. Each module is led by at least one faculty member with subject expertise, and dissertations are supervised and evaluated by a three-member committee. Students come from diverse academic backgrounds. Pre-semester support tutorials are offered to help new students integrate into the programme, an initiative confirmed by both current students and graduates.

Inconsistencies were found (between documents M6.4 and M2.4) regarding teaching hours and ECTS for certain modules (e.g., 859, 869, 863). Document M2.4 also presents module information unevenly, some listing only weekly teaching hours, others including duration and workload details.

As noted in M6.6, the PSP website serves as the primary source of information for

current and prospective students. It provides access to the curriculum, module descriptions, academic calendar, schedules, announcements, certificate applications, registration forms, and dissertation guidelines.

For each postgraduate module, a website is available on the Helios e-learning platform, which contains the module description, contact information for the instructors, educational materials, theoretical and laboratory exercises, assignments, and all announcements regarding the module. PSP students can also be informed about the services provided by the Institution through a variety of websites, for the available, Student facilities, <https://ntua.gr/el/services/facilities-for-students>, Services to students, <https://ntua.gr/el/services/facilities-for-members>, Electronic services, <https://ntua.gr/el/services/electronic-services>, Cultural pursuits, <https://ntua.gr/el/services/culture>, Knowledge without frontiers, <https://ntua.gr/el/school/knowledge-without-frontiers>, Erasmus@NTUA, <http://erasmus.ntua.gr>.

Some links on the PSP website redirect to older e-learning websites, which do not always provide current information about modules. Typically, visitors must take additional steps to access the current Helios e-learning platform.

II. Analysis

The PSP website currently offers only limited information in English. Key documents, such as the Studies Guide and Quality Policy, are only available in Greek, making the site not fully bilingual. Despite the fact that the PSP is funded solely by the host institution, this should be clearly stated in the corresponding documents. Procedures and documentation for attending modules in English or other supported languages need a clear definition, which is missing. Additionally, there are typos in teaching hours and ECTS credits for certain modules between documents M6.4 and M2.4. Some modules display only teaching hours, while others include more detailed information, such as the number of weeks and the distribution of theory and lab exercises. Finally, some links on the site redirect to outdated e-learning platforms, requiring users to take extra steps to find the current Helios e-learning platform.

III. Conclusions

The NTUA provides adequate infrastructure, facilities, and support services for the PSP in Data Science and Machine Learning, as confirmed by students and graduates. Key teaching, administrative, and technical resources are available, including laboratories, libraries, and e-learning platforms.

However, the PSP website is only partially bilingual, with important documents and announcements available solely in Greek, limiting accessibility for international students. The programme's funding, currently fully covered by the host institution, should be clearly documented. Procedures for module attendance in English or other languages lack formal definition and clear documentation, despite Erasmus students occasionally participating in some modules.

Discrepancies were identified in teaching hours and ECTS credits across official documents, and some online links redirect to outdated e-learning platforms, complicating access to current course materials. Overall, while the PSP

demonstrates solid foundational support, improvements are needed in website bilingualism, clarity of administrative procedures, consistency of module information, and maintenance of digital resources.

Panel Judgement

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

Panel Recommendations

- 6.1. Establish a periodic and systematic procedure to ensure all key documents and detailed information on the PSP website are provided consistently in both Greek and English.
- 6.2. Establish a procedure to clearly document in detail the utilisation of resources and fund allocation for the operation of the PSP.
- 6.3. Establish a clear and accessible procedure, in collaboration with the Institution's Erasmus office, to communicate the requirements and documentation for attending modules in English (or other supported languages), ensuring that it is clear and available to interested students.
- 6.4. Establish a regular review process to update, verify and maintain consistency of all website links and provided material, ensuring direct access to current e-learning platforms and avoiding redirects to outdated resources.

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

According to documents M7.1 and M7.4 (data reports from the Integrated National Quality Information System PSP in 'Data Science and Machine Learning'), and as confirmed during a discussion with the PSP director, the School of Electrical and Computer Engineering at the NTUA provides a quality information system containing a substantial amount of relevant PSP data.

Document M7.2 describes the Integrated Information System for Student Affairs, a digital platform designed to support a wide range of academic and administrative services through the Student Registry portal. Its key functionalities include data management for postgraduate students and study programs, user account administration, report generation, web-based access for students and staff, statistical processing, and support services (e.g., food, housing, healthcare).

It also features mechanisms for the evaluation of teaching quality.

Additionally, two digital tools developed by NTUA (reported in document M7.3) complement this system identified. Firstly, Unistats, a data collection and aggregation platform that interacts with third-party systems, consolidating institutional indicators to support internal reporting and monitoring. Secondly, the Business Intelligence Subsystem, a strategic tool designed to support staff management, forecasting, and policy formulation through a unified view of educational data. It aims to integrate both current and future subsystems for a holistic approach to institutional planning.

The second tool is a Business Intelligence subsystem designed for staff management, forecasting and strategic decision-making. It provides an integrated view of educational progress to support the formulation of timely and effective policies. This Business Intelligence tool is designed to consolidate data from all existing and future subsystems, providing a holistic approach to institutional intelligence.

While the system's design reflects an integrated and thoughtful approach to managing student and faculty services, the documentation lacks sufficient illustrative material to assess its actual deployment and effectiveness. Notably absent are user interface screenshots, system walkthroughs, practical usage examples, or case studies. Furthermore, no information is provided on the types of data collected, how they are relevant to PSP governance or how these tools contribute to academic or strategic decision-making. This lack of clarity hinders any assessment of their actual impact and effectiveness in supporting quality assurance processes within the PSP.

Despite these promising components, the documentation provides limited illustrative material. It lacks user interface screenshots, system walkthroughs, case studies, or real-world usage examples. Moreover, there is no information on how collected data inform governance or contribute to academic and strategic decision-making. This makes it difficult to assess the system's practical deployment and effectiveness in supporting the PSP's quality assurance processes.

II. Analysis

The design of the integrated information system reflects a comprehensive and forward-thinking approach to supporting academic and administrative functions. However, its value is undermined by the limited documentation, which does not sufficiently demonstrate its practical implementation or effectiveness.

To better communicate its capabilities, the system's documentation would benefit from the inclusion of concrete examples. For example, automated transcript generation, faculty access to academic records, or reporting on graduate outcomes. These would enhance clarity and showcase how the platform supports key academic services and decision-making processes.

Although the PSP is supported by a Quality Information System intended to centralise and facilitate access to critical data, its current structure is difficult to use for longitudinal or comparative analysis. While data are available on: General

programme information (e.g., ECTS, launch date, duration), Course and programme structure, Faculty profiles, and Student data (including mobility and internationalization), the way this information is presented is not user-friendly, and the redundancy across categories diminishes overall clarity and makes hard to derive any useful trends/protectories that could inform the QA processes and help make informative decisions within the PSP Faculty.

A significant gap is the absence of a structured mechanism within the information system for tracking alumni outcomes. Currently, no data are collected on graduates' career paths, employment integration, or societal contributions. Incorporating alumni tracking into the information system would significantly strengthen the PSP's continuous improvement processes. It would also provide valuable feedback for curriculum development, support long-term impact assessment, and enhance alumni engagement.

III. Conclusions

The NTUA has developed a comprehensive digital information infrastructure for the PSP in Data Science and Machine Learning, including tools such as the Integrated Information System, Unistats, and a Business Intelligence subsystem. While the system is conceptually well-designed and covers a wide range of academic and administrative functions, the documentation lacks practical examples and usability details, limiting the ability to assess its actual deployment and effectiveness. The presentation and structure of available PSP data are not optimally organised for comparative or longitudinal analysis, reducing their utility for PSP monitoring and continuous improvement.

A key area for development is the integration of alumni tracking mechanisms within the information system. Currently, there is no structured process to monitor graduates' career paths or societal impact, representing a missed opportunity for enhancing quality assurance, curriculum relevance, and alumni engagement.

Panel Judgement

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

Panel Recommendations

7.1. Clearly organise PSP data by academic year and key indicators (e.g., graduation rates, course evaluations, progression trends) to enable longitudinal tracking and informed decision-making.

7.2. Supplement quantitative data with qualitative insights and explanatory commentary,

especially where trends indicate significant variation. This will support deeper understanding and encourage evidence-based improvements.

7.3. Improve the presentation of data using visual tools (graphs, charts, and histograms) to make trends and comparisons more accessible to faculty, administrators, and external stakeholders.

7.4. Ensure regular and systematic updates of PSP data, using structured and comparable formats that enhance transparency and support internal and external evaluation processes.

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

As stated in document M8.2 and verified by browsing, there is a dedicated segment on the website of the department for the promotion of the Postgraduate Studies Programme (PSP) (<https://www.ece.ntua.gr/gr/postgraduate/16>). There is full information about the PSP provided on the corresponding website. Partial information is provided in the English language. Therefore, the PSP website can be considered as providing clear and objective information, but not a complete bilingual version. Information about the Announcements, the Services, and Documents, like the Studies Guide, the Quality Policy, and the Complaints Management Regulation, are provided only in the Greek language.

According to document M8.1, the PSP website is the main information source for students, candidates, teachers, and the public. It offers details on the PSP's objectives, organisation, academic calendar, curriculum, modules, and student registration, as well as contact information for the Secretariat. Links to the coordinating School's social media profiles are also provided. The maintenance and update process includes supervision, design, maintenance, inspection, access checks, and content renewal. Members of the School and visitors to the PSP website are invited to provide feedback and questions about the website's content and functionality. Comments can be sent to the Communication and Mediation Office or the Secretariat of the PSP. This feedback process is essential for planning improvements to enhance the website's appeal and user-friendliness.

II. Analysis

The website of the school has a dedicated section for the PSP, providing comprehensive information, though only partial details are available in English. While the site offers clear information, it lacks a fully bilingual version. Key documents such as the Studies Guide and Quality Policy are available only in

Greek.

The website undergoes regular maintenance and updates, and users can provide feedback to improve its functionality via the Communication and Mediation Office or the Secretariat, ensuring the site remains user-friendly.

III. Conclusions

The PSP is characterised as substantially compliant, providing necessary resources for students but needing an enhancement on the internationalisation part.

Panel Judgement

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

Panel Recommendations

8.1. Establish a Quality Assurance Procedure for PSP Website Content to ensure material is provided in both Greek and English.

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 documentation provided for the PSP's internal evaluation, including the report by the Quality Assurance Unit (QAU) and the proposal for academic accreditation, offers only limited insight into a structured and robust internal quality assurance system. While the annual evaluation report is present in the file, it lacks a clear date of preparation, raising concerns about its currency. Moreover, the processes outlined in both documents appear general and lack the procedural detail expected from a functioning and systematic QA framework. The absence of a clearly defined structure for periodic internal evaluation (including frequency, group composition, stakeholder engagement, and decision-making procedures) suggests that the PSP does not fully meet the institution's stated goal of ongoing

monitoring and continuous improvement.

Specifically, the documentation does not adequately demonstrate how the PSP engages in regular and systematic review of its content, student experience, or evolving societal and academic needs. While there is reference to updates and feedback mechanisms, these remain broad and non-specific. There is insufficient information on how students and external stakeholders are involved in programme review processes, whether they hold any formal role or voting power, and how their feedback informs concrete improvements. Furthermore, the lack of an explicit and structured follow-up mechanism to implement recommendations (particularly those emerging from the PSP's own coordinating IEG) undermines the effectiveness of the internal review cycle. A strong follow-up process would include clear responsibilities, timelines, and monitoring steps to ensure meaningful quality improvements.

Additionally, a critical gap identified is the absence of an external expert panel contributing to QA activities. Such panels, when composed of members from academia, industry, governance, and student bodies, provide valuable external perspectives and help align the PSP with broader societal and academic expectations. Their involvement enhances the credibility and relevance of the review process. The establishment of such a panel, alongside a formal and transparent evaluation procedure, would significantly strengthen the PSP's internal quality assurance practices and support alignment with the overarching institutional and national QA framework.

II. Analysis

The available documentation shows limited evidence of a structured and systematic internal quality assurance QA process for the PSP. The internal evaluation report lacks a preparation date and provides only general references to review procedures. Key components such as clear timelines, responsible individuals or bodies, and stakeholder involvement especially students and external experts are either missing or not well articulated.

Although seven recommendations have been submitted regarding mitigation and preventive actions most of which are important, they are presented in an imperative tone without any formal mechanism defined for their implementation. Discussions with students and stakeholders revealed that actions are often carried out through informal ad hoc practices on a best effort basis. This informal approach undermines the effectiveness of the QA process. For a quality assurance system to function properly formal and well documented procedures are essential. Consequently, the PSP needs to establish formal, transparent, and periodic review procedures (driven by their IEG) and involve key stakeholders in decision-making, and periodically document actions with clear responsibilities and timelines.

The absence of an external expert panel limits the inclusion of broader perspectives and weakens the programme's ability to align with academic standards and societal needs. To comply with the institution's QA policy the PSP should implement a structured review process supported by a clear follow up

mechanism, stakeholder participation and a formal system to monitor and evaluate improvements.

III. Conclusions

The current internal quality assurance framework for the PSP lacks the structure, consistency, and formal mechanisms required for effective ongoing monitoring and periodic evaluation. While some annual internal review documentation is available, it is not supported by dated reports, clear processes, or defined responsibilities. The absence of a systematic approach undermines the ability to track progress and implement improvements in a measurable and accountable way.

Although several important recommendations have been made, they are not accompanied by a formal plan for implementation or follow-up. Instead, discussions with students and stakeholders indicate that QA-related actions are often carried out informally on a best effort basis, without official documentation or oversight. This ad hoc approach does not support sustainable quality assurance or continuous improvement.

Moreover, the lack of external expert involvement further weakens the evaluation process, limiting the programme's capacity to align with evolving academic standards and societal needs. Strengthening the internal QA system through structured procedures, formal stakeholder engagement, and clearly assigned responsibilities is essential for ensuring the PSP remains current, effective, and aligned with institutional goals.

Panel Judgement

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

Panel Recommendations

9.1. Designate specific members of the PSP committee or faculty to oversee and report on QA tasks. Assign "owners" for each action item emerging from evaluations, with deadlines and progress-tracking mechanisms.

9.2. Develop a structured follow-up process for tracking the implementation of

recommendations made in internal and external reviews. Ensure actions are documented and evaluated periodically for effectiveness.

9.3. Engage Students and Stakeholders systematically by formalising their participation through feedback tools, advisory panels, or regular consultations, and clarify their role in decision-making.

9.4. Establish an External Expert Panel that includes external experts from academia, industry, governance, and students. This panel should contribute to programme evaluation and offer external perspectives on curriculum relevance and societal impact.

9.5. Ensure that all QA-related documents, including meeting minutes, internal review reports, and action plans, are archived in a central, accessible digital repository. Reports should be consistently dated and version-controlled.

9.6. Use Existing HAHE Reports as Benchmarks: Review QA reports from other PSPs published on HAHE's website to identify good practices and align internal processes with national expectations.

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 administering 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

This is the first external evaluation of the PSP. While HAHE initiated external evaluations of postgraduate programs relatively recently, the PSP was already operational at that time. Consequently, there are no prior external evaluation reports available to support comparative analysis or to inform the current findings. The EEAP did not receive a progress report on the PSP, nor any evidence regarding the implementation of recommendations from the Institution's External Evaluation Report related to postgraduate provision.

Although the PSP faculty and documentation suggest that procedures exist for data collection, internal evaluation, and minute-keeping, the evidence provided lacks specificity and clarity. An example is the M9.1 document that was provided (or the M10.1), there the documented actions appear overly general, with no measurable outcomes, timelines, or clearly assigned responsibilities. There is no indication of mechanisms to monitor progress, report delays, or adjust timelines accordingly. Furthermore, the faculty appeared underprepared for the external review, and there was no indication of established procedures or strategic planning for future internal or external quality assurance processes. This suggests an absence of a coherent system to support faculty in enhancing the documentation and implementation of quality assurance practices.

II. Analysis

There is no previous external evaluation available for the PSP. However, it is essential that the findings and recommendations of this report are given careful consideration and followed through with tangible action. This report will likely serve as one of the primary reference documents for the next external evaluation

panel. Therefore, it is crucial that the PSP management treats these recommendations as a foundation for structured improvement. Actions taken in response should be documented with clearly defined objectives, timelines, and designated responsible individuals or teams.

The IEG must adopt a more systematic and measurable approach to quality assurance. Currently, the absence of SMART (Specific, Measurable, Achievable, Relevant, Time bound) objectives and clearly articulated deliverables in the internal evaluation process limits its effectiveness. To support institutional alignment and ensure coherence with the broader mission of NTUA, including research excellence, national and international development, sustainability, and social impact, the PSP should establish closer coordination with the Quality Assurance Unit (QAU).

It is also recommended that the PSP enhances staff awareness of the importance of ongoing QA practices. Preparation for external review processes must become an integrated part of regular academic and administrative activity rather than an ad hoc effort. Although this may be the PSP's first evaluation, several external review reports are publicly available through HAHE. Proactively reviewing these materials would have enabled the PSP team to better prepare for this accreditation process and to present their materials, such as CVs and documentation, in a more consistent and professional manner. Basic tasks like updating CVs require minimal time and resources and should be part of the routine maintenance of the PSP information system, regardless of the timing of an external review.

Finally, it is important that minutes from all previous years' evaluations are provided rather than only for a single year. Additionally, minutes from other relevant activities, such as discussions related to unit evaluation surveys and other periodic quality assurance practices, should also be included to ensure a comprehensive record of the PSP's QA efforts.

III. Conclusions

The absence of previous evaluations, progress reports, and updates on the implementation of recommendations creates challenges in assessing the PSP's development over time. Evidence of limited preparedness and a lack of formal quality assurance procedures highlights opportunities to strengthen QA awareness and practices within the program.

Routine QA activities, such as systematically updating academic staff webpages and CVs in a consistent format annually, should be integrated into PSP operations. Additionally, providing minutes from all previous years' evaluations and related QA discussions will ensure a comprehensive record of quality assurance efforts.

Panel Judgement

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

Panel Recommendations

10.1. Assign responsible individuals or teams for each QA activity to ensure accountability and timely completion.

10.2. Conduct periodic training and awareness sessions for faculty and staff to reinforce the importance of quality assurance and familiarise them with procedures.

10.3. Establish an external advisory group with representatives from industry, academia, governance, and students, and create a feedback process to ensure QA findings and evaluation outcomes are communicated to all stakeholders and the public.

PART C: CONCLUSIONS

I. Features of Good Practice

- **Strong Academic and Industry Alignment:** The PSP curriculum is well-structured and aligned with EQF and ECTS standards. It covers cutting-edge areas in AI and machine learning, addressing current academic and industry needs.
- **High-Quality Faculty and Student Body:** The teaching staff are internationally recognised experts, and the PSP attracts top-tier students, with a high on-time graduation rate (~85%).
- **Comprehensive Curriculum and Study Guide:** The Study Guide is detailed, outlining structure, learning outcomes, regulations, and expectations, supporting student understanding and engagement.
- **Modern Infrastructure and Student Support:** Students report satisfaction with facilities, technical support, and access to digital resources. Services include personal tutoring, e-learning, and administrative support.
- **Digital Information Systems in Place:** The institution has developed integrated platforms like Unistats and a Business Intelligence system to support data collection, though improvements in usability are needed.
- **Faculty Development and Research Links:** There is a clear policy supporting faculty professional development and collaboration through ERASMUS and international

research networks.

- Positive Student Perception: Both current and former students expressed high satisfaction with their academic experience and support from the staff.

II. Areas of Weakness

- Limited internationalisation and accessibility: The PSP lacks a fully bilingual website and complete English documentation, hindering accessibility for international students. The PSP's visibility and readiness for non-Greek speakers need improvement.
- Inconsistent QA documentation and planning: QA reports and minutes are either missing, vague, or incomplete. Actions are often undocumented, lacking assigned responsibilities and deadlines, making progress difficult to track.
- Low stakeholder engagement in QA processes: There is minimal involvement of external stakeholders and alumni in PSP review or curriculum development, despite their willingness to contribute.
- Informal internal QA practices: QA activities are often carried out informally or reactively. There is no structured process to implement or follow up on improvement recommendations.
- Underutilised student feedback mechanisms: Student participation in surveys is very low (2.5–10%), limiting the usefulness of feedback. There is no clear mechanism showing how feedback leads to changes in the program.
- Insufficient monitoring of graduate outcomes: There is no system in place to track alumni careers, making it hard to assess long-term PSP impact or guide strategic improvements.

III. Recommendations for Follow-up Actions

--Improvements on the existing QA framework and monitoring

- Revisit and revise the PSP's Quality Assurance Statement to include clear goals, measurable metrics, and defined procedures for achieving and evaluating those goals.
- Assign specific members of the PSP committee or faculty as QA task leads, with ownership of actions, deadlines, and progress-tracking mechanisms.
- Develop a structured follow-up system for implementing and reviewing both internal and external evaluation recommendations, ensuring all actions are tracked and periodically assessed.
- Conduct regular training sessions for staff and faculty to promote QA awareness, ensure understanding of roles, and support compliance with institutional and ESG standards

--Internationalisation and Visibility

- Enhance international appeal by increasing English-language instruction, promoting the programme abroad, and highlighting distinctive features such as interdisciplinary strengths.

- Ensure the PSP website and all key documents (Study Guide, Quality Policy, Erasmus procedures) are consistently maintained in both Greek and English (see also Action 6.1).

- Establish clear guidelines and communication channels—especially in English—for Erasmus+ and other international students regarding module availability and participation requirements.

--Stakeholder Engagement and Alumni Tracking

- Formally integrate external stakeholders (industry, alumni, academia) into programme development and QA through advisory panels or consultative mechanisms.

- Implement alumni tracking within the digital information system to monitor graduate outcomes and feed insights into curriculum and strategic development.

- Strengthen student and stakeholder participation in QA by institutionalising feedback tools, surveys, and defined roles in decision-making.

--Student Support, Transparency, and Guide Enhancement

- Update the Student Guide to include operational details such as workload expectations per course/dissertation, procedures for switching study modes, and applying for extensions or deferrals.

- Clearly define and introduce the Academic Advisor role during student orientation, and describe it in the Student Guide, ensuring students are aware of available support mechanisms.

- Establish and promote incentives (e.g., early access to grades or other benefits) to improve student participation in feedback surveys.

--Digital Presence and Website Maintenance

- Establish a QA policy specifically for the PSP website to ensure content is bilingual, up-to-date, and aligned with programme developments.

- Create clear internal procedures for maintaining and verifying the accuracy of online information, particularly links to course material, e-learning platforms, and resource documents.

- Include mechanisms for regular user feedback on website functionality and content to support continuous digital improvement.

IV. Summary & Overall Assessment

The Principles where full compliance has been achieved are:

1, 2, 3, 4, 8

The Principles where substantial compliance has been achieved are:

5, 6, 7, 9, 10

The Principles where partial compliance has been achieved are:

N/A

The Principles where failure of compliance was identified are:

N/A

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

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