Accreditation Report

for the Postgraduate Study Programme of:

Data & Computer Systems Engineering

Department of Computer Science and Engineering
Institution: University of Ioannina
Date: 27 November 2023

Report of the Panel appointed by the HAHE to undertake the review of the Postgraduate Study Programme of **Data & Computer Science Engineering** of the **University of Ioannina** 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 & Computer Science Engineering** of the **University of Ioannina** comprised the following four (4) members, drawn from the HAHE Register, in accordance with Laws 4009/2011 & 4653/2020:

1. **Prof. Sotiris Skevoulis (Chair)**
   Pace University, New York City, USA

2. **Prof. Petros Drineas**
   Purdue University, West Lafayette, USA

3. **Prof. George Angelos Papadopoulos**
   University of Cyprus, Nicosia, Cyprus

4. **Ms. Eftychia Mavrou**
   University of West Attica, Athens Greece

II.   Review Procedure and Documentation

The External Evaluation & Accreditation Panel (EEAP) was formed in the second week of November 2023 and received the accreditation supporting material concerning the Postgraduate Study Programmes (henceforth PSPs) in Data & Computer Systems Engineering (DCSE) as well as in Modern Electronic Technologies (MET) at the University of Ioannina a few days before. The online visit to the Programmes began on November 13th. EEAP had the chance to run a preliminary review of the documents submitted and identified a few omissions. During the visit, all the participants involved (MODIP, Teaching and Administrative staff, students, graduates, and social partners) were very prompt to provide us with all the information we requested. In the end of the first day, EEAP requested several supporting documents and information which MODIP made available the very next day. EEAP expresses heartfelt thanks to the MODIP representatives for the speedy response to its request. All the meetings were conducted online utilizing Microsoft Teams from Monday November 13th to Wednesday November 15th in a very friendly and cooperative spirit. The meetings during the visit were scheduled as follows:

At the welcome meeting, the EEAP met with the Directors of the two PSPs, the Head of the Departments, MODIP, Steering Committees/ OMEA members to discuss the compliance of the PSP to the Quality Standards for Accreditation. At the same time, the department provided us with access to a video of the facilities and grounds. After the end of this meeting, the EEAP members met in a separate zoom meeting to discuss and reflect on their first impressions and prepare for the next day.

The following day, November 14th, at 15:00 the Panel started a sequence of online meetings concerning the first PSP (DCSE) that lasted until 19:30. The teleconferences started with the teaching staff members of the PSP, followed by students, graduates and ended with employers/social partners. The students were asked various questions about their academic life. They expressed their perspectives regarding the structure of the PSP Programme, the challenges they are facing and their experiences so far from the Programme and the University in general.

The next video conference was with some graduate students selected by the Programme. The focus of the EEAP was identifying the graduate student's integration into the industry and their opportunities for further studies. All graduate participants had landed exceptional opportunities in pursuing Ph.D. studies at some prestigious institutions or held excellent positions in the software development industry. At the end of this day EAP had its last follow-up meeting with the OMEA and MODIP representatives during which additional comments and clarifications were brought up. The EEAP gave a short preliminary verbal report about their impressions and findings of the virtual visit. The EEAP thanked everyone for their participation, cooperation, and virtual hospitality.

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

III.   Postgraduate Study Programme Profile

The Postgraduate Study Programme (PSP) in DCSE was established in 2018. The purpose of the Programme is to educate and train young professionals in understanding and methodologically apply their knowledge in Data and Computer Engineering. Graduates of the program can apply scientific and research methods in the development of innovative ideas and cutting-edge technologies. DCSE Programme is putting a lot of emphasis on the development of the necessary soft skills that engineers must have to effectively communicate and present their ideas and solutions to the stakeholders of a project.

DCSE PSP currently has 38 active students and 47 graduate students. Of the graduates, 13 of them are pursuing doctoral studies. Most incoming students come from a Computer Engineering background (58%) while some come from Mathematics (29%) and Physics (10%). The Programme has two specialisation areas namely: a) Data Science and Engineering and b) Advanced Computer Systems. There is a total of twenty-six (26) full time faculty members, nine (9) teaching, two (2) lab assistants, one (1) Research Associate and four (4) professional administrators.

The programme can be completed in 3 (full-time) academic semesters (with a maximum of 5 semesters, plus one for those they had to take preparatory undergraduate classes) and a mandatory Thesis for a total of 90 ECTS. The Thesis is written during the third semester of studies, counts for 30 ECTS. The graduates of the PSP can work in the public and/or private sectors in various professional positions in education, computer, and data engineers.

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 programme is supported by suitable academic and administrative structures that enable a teaching and learning provision according to the institution's quality framework. The procedures followed in planning, delivering, and assessing the

components of the programme appear to be robust and enable consistency across the academic year and the modules comprising the programme.

A Quality Assurance Policy has been established by the PSP of DCSE. (Doc. A2) The relevant document is in compliance with the quality policy of the University of Ioannina and affirms the commitment of the academic unit to establish, maintain, monitor, and improve quality assurance; and clearly defines its implementation through setting of goals for continuous improvement with monitoring and evaluation on an annual basis, collection and analysis of data relevant to quality assurance, as well as management of financial resources. The Panel was presented with a document that only focuses on the quality goals that need to be improved on and was informed that the rest of the goals were identical with the ones from the department that houses the program.

II.   Analysis

The team that delivers the programme comprises very skilled members of faculty, in academic and technical areas. Most of them are graduates of well-established Higher Education Institutions (HEIs) in Greece and abroad. They continue to engage with the subject of their studies and research, expand their knowledge and experience and combine it with new and enhanced experiences gained through research projects. They invest the outcome of this continuous improvement into their teaching and guidance of the students. Outcomes of individual staff research become elements of teaching or inspiration for coursework and projects. These enrich student learning, improve the ability of students to connect theory to real work practice and help develop the employability of the graduates of the programme.

MODIP is monitoring and enforcing the quality assurance principles. The coordination committee of the PSP and the department administration are managing the whole process. The quality data that had been collected was analysed. Strong and weak points were noted, and improvements/corrective actions were proposed. The quality policy of the unit has been published on its web site, and the adopted goals have been listed. The program's faculty maintains a positive attitude towards quality assurance evaluation, and interviews with students indicate a high degree of satisfaction with the quality and relevance of the education offered by the academic unit.

The structure of the programme and the content of the taught modules are reviewed annually following the end of the teaching and assessment period. Beyond the results of the academic review, it appears that comments and suggestions from student surveys, and those obtained by the social partners albeit informally, are also considered in revising a module. This is considered very good practice that sustains the interaction with all partners of the learning community engaged with this programme. The panel felt that although the engagement of social partners appears

to be a dynamic and beneficial process, it operates rather informally. The programme would benefit from a more formal engagement process through the constitution of an advisory board comprising professionals from the public and private sector, as well as representatives from industry and other big employers.

Finally, PSP's graduates appear very supportive of the programme, value the knowledge and experiences accrued and have expressed their satisfaction as to the impact the programme has had on their career. The alumni of a programme are considered a valuable resource not only for the programme but the institution too. They could support further developments, create a careers network that will support future graduates, collaborate with the institution in research and consultancy projects, and possibly offer financial support in the form of donations. It would benefit the programme if they were to create a programme alumni group with a formal status, embraced by the programme team and the department. The impact on maintaining and improving the quality of learning and student experience will benefit the programme in growing in student numbers and reputation

III.   Conclusions

Overall the programme team appears to have engaged very well with the institution and the quality assurance body of it. All procedures for developing, delivering the programme, monitoring the outcomes, and evaluating the results appear to be well in line with the institution's quality framework.

The programme team needs to work to further create a customised document of all quality factors, not only the ones that need to be improved upon. That document would be crucial in the future accreditation visits.

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	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

- The annual audit performed in conjunction with MODIP is well documented, periodic internal reviews carried out by the program administration should include all the quality points and KPIs and not just the ones that need improvement.
- Creating a task force to ensure the quality and accuracy of information provided on the website and to the students.
- The Department should periodically and systematically rationalise existing KPIs and form new ones as required to ensure they are strategically prioritised.
- Ensure that the corrective measures decided during the program's internal evaluation, such as the creation of a complaint hearing mechanism and a system of academic advisors, of improved student social conditions, and attention to the needs of working students have materialised.

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 PRORAMME 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 department provided documentation including a detailed overview of the Master's Program in "Data and Computer Systems Engineering" offered by the Department of Computer Engineering and Informatics at the University of Ioannina. This program, re-established and amended various times, adheres to European and National Qualifications Framework standards. It aims to train engineers in modern computer and IT technologies, making them competitive in their professional fields. Key findings about the program include:

- A curriculum encompassing both theoretical and technological aspects of Computer Engineering and Informatics.
- Specializations in "Data Science and Engineering" or "Advanced Computing Systems".
- A wide range of course subjects, including theoretical computing, artificial intelligence, scientific computing, software engineering, databases, operating systems, parallel and distributed computing systems, networks, telecommunications, and hardware design.
- Learning outcomes focused on knowledge acquisition, skill application in scientific research, ethical and professional conduct, communication skills, and continuous learning abilities.
- A structured assessment methodology ensures student progress and achievement of learning outcomes.
- Opportunities for work experience and internships, locally or abroad.
- Regular updates to course content based on recent developments, market needs, and feedback from graduates.

The program emphasises a strong link between teaching and research, with courses reflecting current developments and a research-based Master's thesis. Additionally, seminars with invited speakers are organised to discuss new research results and technological trends.

II. Analysis

Overall, the program design is well-thought out and well documented. Areas that could be improved include connections with stakeholders (perhaps via an advisory committee board), which could also improve the opportunities for internships and practical training for the student body.

III. Conclusions

The MS in "Data and Computer Systems Engineering" at the University of Ioannina blends theoretical and practical aspects of computer engineering, ensuring graduates are well-equipped for the evolving technological landscape. Its emphasis

on up-to-date course content, diverse specializations, and strong research integration seems to position graduates for success in both academic and professional spheres.

Panel Judgement

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

Panel Recommendations

Design areas that could be improved include:

- Connections with stakeholders (perhaps via an advisory committee board)
- More opportunities for internships and practical training for the student body.

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**

This course provides a student – centred learning, enhancing student's active participation in the learning process. The assessment of each course, (knowledge, skills, and competences) is carried out through predefined procedures which are described

in the Course Outline. The academic staff is familiar with the existing examination system and methods and students are supported in developing their own skills. An evaluation questionnaire is regularly given to the students towards the end of each course. The Master course has no fees, the students provide academic support work (supervision to undergraduate exams, laboratory courses etc).

II.   Analysis

The PSP adopts a student- centred approach in terms of teaching. Furthermore, students are encouraged to develop individual skills by choosing a research paper of their interest, studying it and presenting it to their peers. As students and graduates have assured during the interview, this procedure has helped them practise their presentation skills, engaged them to study thoroughly subjects of their interest, as well as encouraged them to engage in further research. Hence, students are seen as active partners in the learning process. Since each student presents its paper to his/her peers, the group benefits from a variety of research papers' presentations. Furthermore, since the Master course has no fees, the students provide academic support work (supervision to undergraduate exams, laboratory courses etc). They consider this teaching process as part of their learning activities and the workload is not considered as an obstacle for their studies.

The assessment of each course (for obtained knowledge, skills, and competences) is carried out through predefined procedures which are described in the Course Outline. These procedures may include written exams, problem-solving, written assignments, reports, oral examinations, public presentations, laboratory work, etc., and the students are informed about the assessment criteria at the beginning of the learning process. No complaint was registered during the interview on the assessment procedure.

An evaluation questionnaire is regularly given to the students towards the end of each course, however not all students return answers. Teachers are willing to take the students' evaluation under consideration and are seeking ways to get more evaluations. Some of the up- to- now pointed issues are expected to be integrated into the new updated schedule/ curriculum/ procedures.

Students know about the function of the academic advisor; however, they do not seem to need to use it, since the teacher- student relationship as well as the students' relationship is cultivated in mutual respect and the students feel confident to discuss their issues in situ, with the respective professor or fellow peer. They also benefit from the confidence of the relationship with their supervisor, to whom they feel they can address any concern they may have.

They have the option and opportunity to participate to Conferences and to have scientific publication (s) of their work.

III.   Conclusions

The PSP fully complies with the Principle. Students appreciate the fact that knowledge and research practices are up to date, that they are involved in projects both individually and in groups. They feel actively involved in the learning procedure. Furthermore, the pedagogical methods have a variety which includes lectures,

experiments in laboratories or project- based learning. Students value the support of the institution, both in means of infrastructures and stuff (academic and secretarial). They feel that the supervisor professor provides counselling and guidance for the preparation of the thesis and usually he/she undertakes informally the role of the academic advisor.

Panel Judgement

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

Panel Recommendations

None.

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 student admission procedure follows the internal regulations of the course. Student progression is assessed by the course instructors, using for instance a combination of graded assignments and written or oral examinations. Students know the assessment procedure from the beginning of the course. The PSP provides academic support for students coming from other backgrounds. The PSP also supports the participation of students with dyslexia or special needs. ECTS is applied across the curriculum and there is a Student Guide, a Thesis Handbook and all the supporting documents available. The PSP offers the option of practical training and participates in the ERASMUS programme. The Code of Research Ethics is known to the students.

II. Analysis

The admission procedure follows the above conditions: Students should have a high score in their undergraduate degree; they should pass written examinations in selected subjects (see also A1), including electronic terminology in English. Furthermore, an oral examination is required, as well as the provision of their analytic grades of all undergraduate classes. The procedure follows the necessary rules that ensure transparency (see also A1).

Sometimes, the admission Committee accepts a student but considers that he/she lacks the academic background in specific subjects; however, he/she has the required skills, competences and knowledge in the other subjects. In that case they offer him/her the option to take the respective undergraduate subjects in the University, having a 6-month extension

to the Master's duration. This is evaluated as an advantage by the students, since it ensures that they have the necessary knowledge, although a few complained about the extra time of competition. It is an advanced Master course. Students cannot proceed to the Thesis if their overall grade is lower than 6,5/10.

Students feel that they could reach directly to their own professors- especially their supervisor- when they face an issue. They appreciate the structure of the PSP since it has both theoretical and practical courses, it is up to date and are valuing the subjects/ project/ research offered as interesting and intriguing.

There is practical training in place, however some students are already working. In general, practical training and ERASMUS are not fully exploited by the community. Students are satisfied with the research conducted in the PSP and are preferring to focus on their studies in the University in order to proceed either to PhD studies or to the work market.

III.   Conclusions

It is an advanced Master course, which aims to provide the students with the necessary knowledge, skills and competences in order to succeed in their future career. The PSP is described clearly through its respective papers (Student, Guide, Thesis Handbook, Code of Research Ethics etc). The Mater course offers the students the necessary access to research and projects, using a variety of learning methodologies. Stakeholders are satisfied by their collaboration with the graduates of this PSP and are seeking for further networking with the Department.

Panel Judgement

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

Panel Recommendations

To reinforce the collaboration with the stakeholders on a regular basis, to further support networking with other institutions, to provide more attractive Erasmus/ mobility and practical training.

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 Data Science and Engineering program is offered by the Department of Computer Science and Engineering. The offered courses are taught primarily by the faculty of the Department. The hiring (or the promotion) of any faculty member in Greek universities is governed by national laws. The Department attracts high calibre candidates for any available faculty vacancy. The panel was told that around 1-2 faculty members take advantage of sabbatical leaves; however, this does not appear to be mentioned in any official documentation. The faculty also takes advantage of mobility opportunity. The workload of the faculty is between around 6-12 hours per week, which is considered appropriate, aligns with international good practices, and leaves sufficient time for research activities. It is evident that the offered program is linked to the research activities of the faculty, as a number of graduate theses generate scientific publications, and a number of this program's graduates pursue Ph.D. studies. There is an established procedure for the faculty getting feedback from the students by means of suitably formed questionnaires; however, the percentage of students filling these questionnaires is not mentioned in the provided documentation and therefore it is unclear if the results of processing these questionnaires are of statistical value. The specialisations and research

interests of the faculty aligns well with the theme, scope, and offered courses of the program in question.

II. Analysis

The instructors have the required qualifications, and the offered program aligns well with the interests of the department. There is financial support for the faculty via Erasmus+ for mobility.

III. Conclusions

Overall there is a well-established procedure for the recruitment of teaching staff and good conditions for undertaking their duties.

Panel Judgement

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

Panel Recommendations
- Increase the participation of students in providing feedback
- Increase the number of faculty taking advantage of sabbatical leaves

PRINICPLE 6: LEARNING RESOURCES AND STUDENT SUPPORT

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

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

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

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

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

The PSP has the necessary facilities which ensure the appropriate teaching and learning environment. The course provides laboratories for experimental research and participation in projects. The course cannot be done online, since laboratories and equipment are necessary for hands-on-learning.

II. Analysis

Students and graduates have evaluated the infrastructures of the PSP as satisfying and adequate, modern, and useful. The topics and research projects offered are intriguing and the students are taking advantage of the facilities and learning provisions of the course. The stakeholders are benefiting from their collaboration with graduates of this course and are willing to strengthen the networking with the Liaison Office of the University and hence, with

the students. Students participate in conferences and have scientific publication(s). Students feel supported by the administrative and academic staff.

III.   Conclusions

Graduates and stakeholders have validated the quality of the provision of the PSP both in infrastructures as well as in knowledge, competences, and skills. The PSP has supplied the graduates with tools that are being used in their careers. Students are aware of the available services and are exploiting the adequate instruments for their research interests. Stakeholders are valuing the fact that graduates are familiar with state-of-the-art IT tools and are willing to cultivate regular networking activities with the PSP.

Panel Judgement

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

Panel Recommendations
None.

PRINCIPLE 7: INFORMATION MANAGEMENT

INSTITUTIONS BEAR FULL RESPONISBILITY FOR COLLECTING, ANALYSING AND USING INFORMATION, AIMED AT THE EFFICIENT MANAGEMENT OF POSTGRADUATE STUDY PROGRAMMES AND RELATED ACTIVITIES, IN AN INTEGRATED, EFFECTIVE AND EASLILY 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

In our meetings with the faculty, staff, students, graduates, and stakeholders, as well as by studying the material provided by the department, we identified the following key findings regarding information management by the DCSE-PSP program:

- Quality Data Collection: Data related to PMS are collected from various sources, including the Integrated National Quality Information System of the HAHE, student logs, electronic questionnaires, and annual internal reports. This data encompasses information about student and staff performance, student population, and structural and mobility aspects of PMS.
- Information Collection and Analysis Process: The process involves several steps, starting with data collection and registration in HAHE''s system. This includes gathering quality data at the beginning of each year, followed by MODIP submitting this data to HAHE. MODIP also publishes annual reports and quality indicators, which are then sent to the Department for analysis and use in internal evaluations.

- Tools and Procedures: The University employs an integrated quality information system, Class Web, and an e-course Asynchronous Distance Learning Platform. These tools aid in monitoring student performance, managing course-related activities, and disseminating educational material.

II.   Analysis

Our analysis reveals a rather robust and relatively multi-faceted approach to managing the DCSE-PSP program at the University of Ioannina. The use of various data collection sources, including HAHE's Integrated National Quality Information System and student feedback, ensures a diverse and comprehensive dataset. The process of data collection, analysis, and reporting (as well as the use of tools like Class Web and the e-course platform), indicates a commitment to using technology for efficient management and quality improvement. This approach enhances the educational experience.

III.   Conclusions

The information management processes seem to be used for improving and revising study programs, aligning them with the Department's objectives. This improvement cycle is crucial for maintaining the quality and relevance of the DCSE-PSP program.

Panel Judgement

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

Panel Recommendations

The program could attempt to collect even more data from the students, either in the form of course evaluations or using other free-form surveys and informal mechanisms. More data points could result in better decisions for the program.

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

Based on our discussions with faculty, staff, students, graduates and stakeholders, the following findings were highlighted:

- Public Information: Programs are required to publish information about their activities in a clear, objective, and accessible manner. This is primarily done through the program's website, which is part of the Department's overall website. The website is updated regularly and includes information about study programs, contact details, links to study regulations, and more.
- Target Audience: The website caters to various groups including postgraduate students, PhD candidates, post-doctoral researchers, undergraduate students, the public, and the scientific community. It aims to inform these groups about various aspects like curriculum, scholarships, research opportunities, as well as job opportunities.
- Website content: The website provides a brief description of the PMS, course outlines, information on governing bodies, and a list of useful documents for different stakeholders like students and faculty members. It also includes CVs and contact information of professors.
- Multilingual Content: The information is available in Greek and English. However, the non-Greek part of the website is severely lacking and many links point to documents in Greek.
- Dissemination of Information: Beyond the website, important information is also disseminated via email and social media platforms like Facebook and LinkedIn. For exceptionally important announcements, printed notices are also displayed on departmental bulletin boards.
- Content Determination and Control: The content of the PMS website is determined by various departmental committees and updated as needed.

II.   Analysis

The department seems to have a comprehensive approach to disseminating information about the study program. There is an emphasis on clear, accessible, and regularly updated information. The use of multilingual content is not ideal and could be improved. The involvement of various departmental committees in content control and the use of multiple channels for information dissemination, including social media and emails, is a solid approach to communication. This strategy ensures the accuracy and relevance of the information and demonstrates the unit's dedication to keeping stakeholders informed and involved in the academic environment.

The department could do a better job communicating the department's policies on bullying, harassment in any shape and form, and discrimination. Students and graduates seemed to be mostly unaware of such policies and relevant resources.

III.   Conclusions

A good policy for disseminating information using various resources. The multilingual aspect of the policy is lacking, at least in its current implementation. The department could also do a better job communicating the department's policies on bullying, harassment in any shape and form, and discrimination.

Panel Judgement

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

Panel Recommendations
- The program might want to consider increasing its online footprint, by providing more material in English, especially if it seeks to target non-native Greek speakers in the future (apparently, there are already a few such students in the program).
- Another important topic for the program to consider is the addition of more details regarding the department's policies on bullying, harassment in any shape and form, and discrimination. Students and graduates seemed to be mostly unaware of such policies and relevant resources.

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
There is a well-established procedure in place for the monitoring and periodic review of the programme. There is a clear distribution of responsibilities and roles of all parties involved in this process. The monitoring process involves the Internal Evaluation Team (OMEA), the Departmental academic and administrative staff, and the current students, However, external stakeholders are not involved in the feedback process. This process is taking place annually, covers all aspects of such an evaluation exercise (programme content, workload, student assessment, etc.) and its findings are reported to the University's Quality Assurance Unit (MODIP) for final approval. The involvement of the students by means of filling questionnaires is documented but, in general, the response is rather low. Also, the KPIs that were provided to the panel do not reflect the assessment and monitoring process that is being claimed to be followed.

II. Analysis

There is a well-established mechanism is in place for internal feedback that is used for annual internal reviews and audits. The level of student participation via the questionnaires should be improved as well as feedback from other stakeholders. The action that is being taken by the department as a response to the internal evaluation process needs to be clearly documented in the KPIs

III. Conclusions

Overall, a well-established mechanism with some need for improvement.

Panel Judgement

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

Panel Recommendations

- Increase the level of participation of students as well as incorporate external stakeholders as a feedback mechanism in the monitoring and periodic internal evaluation process.
- Document the actions taken in response to the internal monitoring and evaluation process by means of specific KPIs.

PRINCIPLE 10: REGULAR EXTERNAL EVALUATION OF POSTGRADUATE STUDY PROGRAMMES

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

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

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

Study Programme Compliance

I. Findings

The panel found that the curriculum was designed and established in accordance with the relevant policies of the organisation in cooperation with the internal quality assurance system "MODIP". The program also strives to demonstrate the continuous improvement of educational methods, as well as the high quality and effectiveness of services, in line with international practices and HAHE principles and guidelines. Faculty and staff are aware of the importance of external review and the benefits it brings to the continuous improvement of the programme.

II. Analysis

The department has established an Internal Review Committee (OMEA) made up of DEP/Student members and MODIP staff. Its function is to collect, analyse and annually present all data related to the university program. As part of these policies, the Institutional Quality Assurance Unit (MODIP) oversees the internal and external evaluation of the University's academic departments and their programs. The panel is pleased with the reported periodic review of compliance with the department's commitment to quality assurance policies and standards, as required by the HAHE Code of Practice.

Throughout the evaluation process, the panel found that the faculty was fully aware of the importance of external assessment. At the same time, all the academic unit's stakeholders appear to be interested in participating in future programme assessment activities. In this respect, the department must develop and strengthen a detailed action plan and a concrete roadmap to implement the recommendations made in this report.

As this is the first evaluation of the programme, principle 10 cannot be properly and fully evaluated. Considering the documentation provided and submitted by the department and

the understandings obtained from the current accreditation, the panel expects that the department will be able to continue successfully conducting new external audits in the future.

III. Conclusions

Many aspects of the department's activities and functions confirm very good practices. The department's commitment to the spirit and processes of quality assurance is evident in all principles and aspects. Passionate faculty and staff self-assess the program and its courses and demonstrate outstanding teamwork. Both groups work very hard to support the program and the students, both academically and personally. The panel rates the principle as "fully compliant", based on the above considerations.

Panel Judgement

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

Panel Recommendations

- The Department is encouraged to continue its internal quality assurance procedures for annual internal assessment and evaluation of academic programs to achieve objectives through monitoring and evaluation for improvement continuous.
- Develop effective ways to increase student engagement in completing questionnaires to ensure consistent statistical results.

PART C: CONCLUSIONS

I.   Features of Good Practice

- Support for mobility of teaching staff
- Active involvement of students in research activities
- Aligning of the program's theme and aims with the faculty's research profile
- Modern equipment
- Student – centred learning, enhancing student's active participation in the learning process
- Good student- teacher and staff relationship
- Advanced Master course with good professional/ academic development

II.   Areas of Weakness

- Connections with stakeholders could be improved (perhaps via an advisory committee board).
- The department could offer more opportunities for internships and practical training for the student body.
- The program might want to consider increasing its online footprint, by providing more material in English.
- Another important topic for the program to consider is the addition of more details regarding the department's policies on bullying, harassment in any shape and form, and discrimination. Students and graduates seemed to be mostly unaware of such policies and relevant resources.

III.   Recommendations for Follow-up Actions

- Stronger networking with the stakeholders during the studies. Stakeholders are interested in providing practical training or other links.
- The annual audit performed in conjunction with MODIP is well documented, periodic internal reviews carried out by the program administration should include all the quality points and KPIs and not just the ones that need improvement.
- Creating a task force to ensure the quality and accuracy of information provided on the website and to the students.
- The Department should periodically and systematically rationalise existing KPIs and form new ones as required to ensure they are SMART12 defined and strategically prioritised.
- Ensure that the corrective measures decided during the program's internal evaluation, such as the creation of a complaint hearing mechanism and a system of academic

advisors, of improved student social conditions, and attention to the needs of working students have materialised.

- Connections with stakeholders (perhaps via an advisory committee board);
- More opportunities for internships and practical training for the student body.
- To reinforce the collaboration with the stakeholders on a regular basis, to further support networking with other institutions, to provide more attractive Erasmus/ mobility and practical training.
- Increase the participation of students in providing feedback
- Increase the number of faculty taking advantage of sabbatical leaves
- The program could attempt to collect even more data from the students, either in the form of course evaluations or using other free-form surveys and informal mechanisms. More data points could result in better decisions for the program.
- The program might want to consider increasing its online footprint, by providing more material in English, especially if it seeks to target non-native Greek speakers in the future (apparently, there are already a few such students in the program).
- Another important topic for the program to consider is the addition of more details regarding the department's policies on bullying, harassment in any shape and form, and discrimination. Students and graduates seemed to be mostly unaware of such policies and relevant resources.
- Increase the level of participation of students as well as incorporate external stakeholders as a feedback mechanism in the monitoring and periodic internal evaluation process.
- Document the actions taken in response to the internal monitoring and evaluation process by means of specific KPIs.
- The Department is encouraged to continue its internal quality assurance procedures for annual internal assessment and evaluation of academic programs to achieve objectives through monitoring and evaluation for improvement continuous.
- Develop effective ways to increase student engagement in completing questionnaires to ensure consistent statistical results.

IV.   Summary & Overall Assessment

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

The Principles where substantial compliance has been achieved are**: 1 and 8.**

The Principles where partial compliance has been achieved are: **9.**

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

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

The members of the External Evaluation & Accreditation Panel

Name and Surname   **Signature**

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