Doc. 300.1.1

Date: Date.

External Evaluation Report

(Conventional-face-to-face programme of study)

- **Higher Education Institution:**

  Cyprus University of Technology

- **Town:** Limassol

- **School/Faculty (if applicable):** Engineering and Technology

- **Department/ Sector:** Electrical Engineering, Computer Engineering and Informatics

- **Programme of study- Name (Duration, ECTS, Cycle)**

  In Greek:

  Μεταπτυχιακό MSc Επιστήμης και Μηχανικής Δεδομένων

  In English:

  MSc in Data Science and Engineering

- **Language(s) of instruction:** Language(s)

ΚΥΠΡΙΑΚΗ ΔΗΜΟΚΡΑΤΙΑ
REPUBLIC OF CYPRUS

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- **Programme's status:** Choose status

- **Concentrations (if any):**

  In Greek: Concentrations
  In English: Concentrations

The present document has been prepared within the framework of the authority and competencies of the Cyprus Agency of Quality Assurance and Accreditation in Higher Education, according to the provisions of the "Quality Assurance and Accreditation of Higher Education and the Establishment and Operation of an Agency on Related Matters Laws of 2015 to 2019" [N. 136 (I)/2015 to N. 35(I)/2019].

A. Introduction

This part includes basic information regarding the onsite visit.

The External Evaluation Committee (EEC) had a preliminary remote meeting on 9.6.2021 to discuss the program evaluation process. On 17.6.2021, the EEC visited the Cyprus University of Technology and met faculty members, staff and students remotely with an online video conferencing tool in order to evaluate the MSc Computer Engineering and Informatics Program. The visit was arranged and facilitated by Natasa Kazakaiou, representing the Agency of Quality Assurance and Accreditation in Higher Education. Before the online visit, the EEC members were provided with relevant program documents and videos to review.

The EEC was presented with detailed information about the university, the department and the MSc degree program. During the visit the EEC requested and received additional material including statistics, regulations, policies, and presentations. During the site visit, the EEC met university, school and department leadership peers and met professors, teachers and administrators. It also met current and past students of the program.

Based on the examination and evaluation of the accreditation materials and the remote site visit, the EEC concludes that the required standards are met, most of them fully, and a few of them partially. The present assessment report describes how the standards are met and provides recommendations and suggestions for improving the program under evaluation.

B. External Evaluation Committee (EEC)

Name	Position	University
Christina Lioma	Professor	University of Copenhagen, Denmark
Zhiguo Ding	Professor	University of Manchester, U.K.
Gianluigi Zavattaro	Professor	University of Bologna, Italy
Christos Charalambous	Electronics and Computer Engineer	ETEK, Cyprus
Chrysovalantis Christodoulou	Student in Computer Science	University of Cyprus

C. Guidelines on content and structure of the report

- *The external evaluation report follows the structure of assessment areas.*

- *At the beginning of each assessment area there is a box presenting:*
  (a) sub-areas
  (b) standards which are relevant to the European Standards and Guidelines (ESG)
  (c) some questions that EEC may find useful.

- *The questions aim at facilitating the understanding of each assessment area and at illustrating the range of topics covered by the standards.*

- *Under each assessment area, it is important to provide information regarding the compliance with the requirements of each sub-area. In particular, the following must be included:*

  ### *Findings*

  A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

  ### *Strengths*

  A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

  ### *Areas of improvement and recommendations*

  A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

- *The EEC should state the compliance for each sub-area (Non-compliant, Partially compliant, Compliant), which must be in agreement with everything stated in the report. It is pointed out that, in the case of standards that cannot be applied due to the status of the HEI and/or of the programme of study, N/A (= Not Applicable) should be noted.*

- *The EEC should state the conclusions and final remarks regarding the programme of study as a whole.*

- *The report may also address other issues which the EEC finds relevant.*

1. Study programme and study programme's design and development
(ESG 1.1, 1.2, 1.7, 1.8, 1.9)

Sub-areas

1.1 Policy for quality assurance
1.2 Design, approval, on-going monitoring and review
1.3 Public information
1.4 Information management

1.1 Policy for quality assurance

Standards

- *Policy for quality assurance of the programme of study:*
  - *has a formal status and is publicly available*
  - *supports the organisation of the quality assurance system through appropriate structures, regulations and processes*
  - *supports teaching, administrative staff and students to take on their responsibilities in quality assurance*
  - *ensures academic integrity and freedom and is vigilant against academic fraud*
  - *guards against intolerance of any kind or discrimination against the students or staff*
  - *supports the involvement of external stakeholders*

1.2 Design, approval, on-going monitoring and review

Standards

- *The programme of study:*
  - *is designed with overall programme objectives that are in line with the institutional strategy and have explicit intended learning outcomes*
  - *is designed by involving students and other stakeholders*
  - *benefits from external expertise*
  - *reflects the four purposes of higher education of the Council of Europe (preparation for sustainable employment, personal development, preparation for life as active citizens in democratic societies, the development and maintenance, through teaching, learning and research, of a broad, advanced knowledge base)*

- *is designed so that it enables smooth student progression*
- *is designed so that the exams' and assignments' content corresponds to the level of the programme and the number of ECTS*
- *defines the expected student workload in ECTS*
- *includes well-structured placement opportunities where appropriate*
- *is subject to a formal institutional approval process*
- *results in a qualification that is clearly specified and communicated, and refers to the correct level of the National Qualifications Framework for Higher Education and, consequently, to the Framework for Qualifications of the European Higher Education Area*
- *is regularly monitored in the light of the latest research in the given discipline, thus ensuring that the programme is up-to-date*
- *is periodically reviewed so that it takes into account the changing needs of society, the students' workload, progression and completion, the effectiveness of procedures for assessment of students, student expectations, needs and satisfaction in relation to the programme*
- *is reviewed and revised regularly involving students and other stakeholders*

1.3 Public information

Standards

- *Regarding the programme of study, clear, accurate, up-to date and readily accessible information is published about:*
    - *selection criteria*
    - *intended learning outcomes*
    - *qualification awarded*
    - *teaching, learning and assessment procedures*
    - *pass rates*
    - *learning opportunities available to the students*
    - *graduate employment information*

1.4 Information management

Standards

- *Information for the effective management of the programme of study is collected, monitored and analysed:*
    - *key performance indicators*
    - *profile of the student population*
    - *student progression, success and drop-out rates*

- o *students' satisfaction with their programmes*
- o *learning resources and student support available*
- o *career paths of graduates*

- *Students and staff are involved in providing and analysing information and planning follow-up activities.*

You may also consider the following questions:

- *What is the procedure for quality assurance of the programme and who is involved?*

- *Who is involved in the study programme's design and development (launching, changing, internal evaluation) and what is taken into account (strategies, the needs of society, etc.)?*

- *How/to what extent are students themselves involved in the development of the content of their studies?*

- *Please evaluate a) whether the study programme remains current and consistent with developments in society (labour market, digital technologies, etc.), and b) whether the content and objectives of the study programme are in accordance with each other?*

- *Do the content and the delivery of the programme correspond to the European Qualifications Framework (EQF)?*

- *How is coherence of the study programme ensured, i.e., logical sequence and coherence of courses? How are substantial overlaps between courses avoided? How is it ensured that the teaching staff is aware of the content and outputs of their colleagues' work within the same study programme?*

- *How does the study programme support development of the learners' general competencies (including digital literacy, foreign language skills, entrepreneurship, communication and teamwork skills)?*

- *What are the scope and objectives of the foundation courses in the study programme (where appropriate)? What are the pass rates?*

- *How long does it take a student on average to graduate? Is the graduation rate for the study programme analogous to other European programmes with similar content? What is the pass rate per course/semester?*
- ***How is it ensured that the actual student workload is in accordance with the workload expressed by ECTS?***
- *What are the opportunities for international students to participate in the study programme (courses/modules taught in a foreign language)?*
- *Is information related to the programme of study publicly available?*
- *How is the HEI evaluating the success of its graduates in the labor market? What is the feedback from graduates of the study programme on their employment and/or continuation of studies?*
- *Have the results of student feedback been analysed and taken into account, and how (e.g., when planning in-service training for the teaching staff)?*
- *What are the reasons for dropping out (voluntary withdrawal)? What has been done to reduce the number of such students?*

Findings

A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

This is a well-organized and delivered programme. The programme was established with clear motivations, and the topics offered in the programme are appropriate and balanced. The intended learning outcomes of the programme have been clearly defined, and the department has provided good learning opportunities and facilities to the students involved in the programme. The department implements a flexible process of teaching and learning which ensures the quality of the provided programme. The programme helps the students who graduate from the programme for their future employment. The department also provided detailed information about the profiles and statistics of the students enrolled in the programme.

Strengths
A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

The ECC has found that this programme has been offered to students at international standards for topics, quality of teaching, resources and infrastructures. The content and topics covered by the programme are consistent to the objectives of the programme, and appropriate to support the development of the students' general competencies, where the students not only get the chance to build their academic background, but also have the opportunity to build their communication and teamwork skills. In addition, the department maintains a national strength in research, and is capable to integrate their research activities in teaching. As a result, the department has been able to bridge the gap between research and teaching, where this programme has benefited a lot from those research activities.

Areas of improvement and recommendations
A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

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The department may want to carry out regular and formal course review. This is particularly important to this programme due to the nature of the cutting edge topics covered by the programme. For example, such course reviews can help the department to maintain the balance between the topics to be offered, and provide a chance to update/add/remove certain topics. In addition, these course reviews can ensure a systematic review about the amount of assessments expected by the students and ensure a balanced workload throughout the academic year. Furthermore, these course reviews could be also helpful to improve the sustainability of the programme by bridging the gap between the learning outcomes of the programme and the skills expected in the job market.

In addition, the department may want to carry out formal moderation to the assessment and marking. At this stage, such assessment moderation has been carried out by relying on the individual faculty members who produce the assessment. It could be useful if formal moderation is carried out to check the appropriateness of the assessments, before they are passed to the students. Similarly, it is useful to have a type of moderation activities to check the markings. The department has acknowledged the importance of this, and also informed the EEC that this type of practice has not been carried out in the university formally. Nevertheless, the department may want to consider a pilot for this useful academic practice.

Please select what is appropriate for each of the following sub-areas:

Sub-area		Non-compliant/ Partially Compliant/Compliant
1.1	Policy for quality assurance	*Compliant*
1.2	Design, approval, on-going monitoring and review	*Compliant*
1.3	Public information	*Compliant*
1.4	Information management	*Compliant*

2. Student – centred learning, teaching and assessment *(ESG 1.3)*

> **Sub-areas**
> **2.2 Process of teaching and learning and student-centred teaching methodology**
> **2.3 Practical training**
> **2.4 Student assessment**

2.1 Process of teaching and learning and student-centred teaching methodology

Standards

- *The process of teaching and learning supports students' individual and social development.*
- *The process of teaching and learning is flexible, considers different modes of delivery, where appropriate, uses a variety of pedagogical methods and facilitates the achievement of planned learning outcomes.*
- *Students are encouraged to take an active role in creating the learning process.*
- *The implementation of student-centered learning and teaching encourages a sense of autonomy in the learner, while ensuring adequate guidance and support from the teacher.*
- *Teaching methods, tools and material used in teaching are modern, effective, support the use of modern educational technologies and are regularly updated.*
- *Mutual respect within the learner-teacher relationship is promoted.*
- *The implementation of student-centred learning and teaching respects and attends to the diversity of students and their needs, enabling flexible learning paths.*
- *Appropriate procedures for dealing with students' complaints regarding the process of teaching and learning are set.*

2.2 Practical training

Standards

- *Practical and theoretical studies are interconnected.*
- *The organisation and the content of practical training, if applicable, support achievement of planned learning outcomes and meet the needs of the stakeholders.*

2.3 Student assessment

Standards
- *Assessment is consistent, fairly applied to all students and carried out in accordance with the stated procedures.*
- *Assessment is appropriate, transparent, objective and supports the development of the learner.*
- *The criteria for the method of assessment, as well as criteria for marking, are published in advance.*
- *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.*
- *Assessment, where possible, is carried out by more than one examiner.*

- *A formal procedure for student appeals is in place.*
- *Assessors are familiar with existing testing and examination methods and receive support in developing their own skills in this field.*
- *The regulations for assessment take into account mitigating circumstances.*

You may also consider the following questions:

- *How is it monitored that the teaching staff base their teaching and assessment methods on objectives and intended learning outcomes? Provide samples of examination papers (if available).*
- *How are students' different abilities, learning needs and learning opportunities taken into consideration when conducting educational activities?*
- *How is the development of students' general competencies (including digital skills) supported in educational activities?*
- *How is it ensured that innovative teaching methods, learning environments and learning aids that support learning are diverse and used in educational activities?*
- *Is the teaching staff using new technology in order to make the teaching process more effective?*
- *How is it ensured that theory and practice are interconnected in teaching and learning?*
- *How is practical training organised (finding practical training positions, guidelines for practical training, supervision, reporting, feedback, etc.)? What role does practical training have in achieving the objectives of the study programme? What is student feedback on the content and arrangement of practical training?*
- ***Are students actively involved in research? How is student involvement in research set up?***
- *How is supervision of student research papers (seminar papers, projects, theses, etc.) organised?*
- ***Do students' assessments correspond to the European Qualifications Framework (EQF)?***
- *How are the assessment methods chosen and to what extent do students get supportive feedback on their academic progress during their studies?*
- *How is the objectivity and relevance of student assessment ensured (assessment of the degree of achievement of the intended learning outcomes)?*

Findings
A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

The panel found that the process of teaching and learning of this programme is appropriate to the topics covered by the programme, and the delivery of the programme is also appropriate for the expected learning outcomes. Students are provided the chance to provide their suggestions to the programme. The Department provides a supportive and encouraging learning environment to students, where students are not only supported by faculty members but also by the well organized administrative team. In addition, the department has also provided an encouraging environment to the teaching faculty members. The structure of the program reflects well the student needs for both what concerns education and personal wellbeing. The department implements a flexible process of teaching and learning which ensures the quality of the provided programme. The carried out teaching methods are appropriate to ensure that theory and practice are interconnected in teaching and learning.

Strengths
A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

The programme has been delivered at an international standard. The students on the programme have been well looked after, particularly during the Covid-19 pandemic. In particular, during the pandemic, the students were offered well organized online teaching, where both lectures and labs have been carried out via Google Meetings and Zoom. The department has provided good online learning facilities to support such online learning. For example, students on the programme have access to the computer servers and are provided remote access licences for those software used in the programme, such as Matlab. Furthermore, the faculty members have provided pre-recoded lecture materials to students. These good practices have been well acknowledged and appreciated by the students on the programme. The programme enjoys a good staff-student ratio, which means that each student can get sufficient support.

Areas of improvement and recommendations
A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

Students' feedback is crucial to the development of any teaching programme. Currently, the department has provided opportunities to students for feeding their suggestions back to the department, by asking each student to complete a questionnaire about each course at the end of each semester. This questionnaire contains both the suggestions to the course as well as to faculty members who deliver the course. Additional feedback mechanisms could be provided to students if they want to provide suggestions at the programme level. In addition, regular student-staff meetings can also be useful for the interaction between the department and students, where a few student representatives can be selected and asked to attend such meetings. Furthermore, such staff-student meetings can also be used as venues to inform the students what actions have been taken by the department for the students' feedback.

This programme is about data science, which is a subject closely related to industries. Because of the nature of this programme, students enrolled on this programme can benefit a lot if formal partnerships between the department and industries can be established. As such, students can have more opportunities for carrying out their placement and internship. More interactions between the department and the enterprise and career office in the university can also be helpful towards this purpose.

Please select what is appropriate for each of the following sub-areas:

Sub-area		Non-compliant/ Partially Compliant/Compliant
2.1	Process of teaching and learning and student-centred teaching methodology	Compliant
2.2	Practical training	Compliant
2.3	Student assessment	Compliant

3. Teaching staff *(ESG 1.5)*

Sub-areas

3.1 **Teaching staff recruitment and development**
3.2 **Teaching staff number and status**
3.3 **Synergies of teaching and research**

3.1 **Teaching staff recruitment and development**

Standards

- *Institutions ensure the competence of their teaching staff.*
- *Fair, transparent and clear processes for the recruitment and development of the teaching staff are set up.*
- *Teaching staff qualifications are adequate to achieve the objectives and planned learning outcomes of the study programme, and to ensure quality and sustainability of the teaching and learning.*
- *The teaching staff is regularly engaged in professional and teaching-skills training and development.*
- *Promotion of the teaching staff takes into account the quality of their teaching, their research activity, the development of their teaching skills and their mobility.*
- *Innovation in teaching methods and the use of new technologies is encouraged.*
- *Conditions of employment that recognise the importance of teaching are followed.*
- *Recognised visiting teaching staff participates in teaching the study programme.*

3.2 **Teaching staff number and status**

Standards

- *The number of the teaching staff is adequate to support the programme of study.*
- *The teaching staff status (rank, full/part time) is appropriate to offer a quality programme of study.*
- *Visiting staff number does not exceed the number of the permanent staff.*

3.3 **Synergies of teaching and research**

Standards

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- *The teaching staff collaborate in the fields of teaching and research within the HEI and with partners outside (practitioners in their fields, employers, and staff members at other HEIs in Cyprus or abroad).*
- *Scholarly activity to strengthen the link between education and research is encouraged.*
- *The teaching staff publications are within the discipline.*
- *Teaching staff studies and publications are closely related to the programme's courses.*
- *The allocation of teaching hours compared to the time for research activity is appropriate.*

You may also consider the following questions:

- *How are the members of the teaching staff supported with regard to the development of their teaching skills? How is feedback given to members of the teaching staff regarding their teaching results and teaching skills?*
- *How is the teaching performance assessed? How does their teaching performance affect their remuneration, evaluation and/or selection?*
- *Is teaching connected with research?*
- *Does the HEI involve visiting teaching staff from other HEIs in Cyprus and abroad?*
- *What is the number, workload, qualifications and status of the teaching staff (rank, full/part timers)?*
- *Is student evaluation conducted on the teaching staff? If yes, have the results of student feedback been analysed and taken into account, and how (e.g., when planning in-service training for the teaching staff)?*

Findings
A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

The EEC considered the submitted documentation and met with staff to understand the clarity and fairness of the approach on how the university recruits, appoints, inducts and supports academic staff in delivering high quality teaching, research and student experience. Based on these, the recruitment and selection procedure seems to be fair and clear. There are clear criteria for different teaching ranks (professor, associate professor etc.) and clear guidelines for progression and promotion.

There are some central procedures to support staff induction and staff development. However, these are not systematically structured and there is no training activity menu. Another shortcoming is that new academic staff are not always assigned a mentor. On the positive side, the EEC has found that the university is supporting its staff undertake research and publish their research findings. Support is in both financial and time allowance terms. The

minimum teaching load is 6 hours of teaching per week. Staff is expected to teach approximately 25-30% of their time. A startup package of approximately 40000 Euros in research funding (for 2 years) and approximately 15000 Euros for equipment is offered to newly hired staff. Sabbaticals of approximately 6 months are offered to staff every 3 years. The research output of the staff involved in this program, over the last 7 years, includes: 170+ journal publications, 22+ conference publications, 15500+ citations, 5 patents, 36 book chapters, 45+ externally funded research projects (8.4 million Euros brought in during the last 5 years alone). Part of this research output is disseminated through internationally elite publications, such as Nature. Collectively, the above figures are impressive.

The link between teaching and research is healthy. Students of the program have been co-authors in scientific publications. Other graduates of the programme are pursuing a PhD in this area.

There are currently 5 academic staff involved in the program delivery (all of them are men). Out of the 5, 1 is a full professor, 1 is associate, 3 are assistant professors. There was one more professor, who recently passed away, and this position is expected to be filled in the near future, raising the total professorial number to 6. There are also a few lecturers involved in the programme, as well as a number of non-permanent scientific staff. Almost all faculty staff have a PhD. There is a small number of staff who do not have a PhD (they are transferred to the university from higher educational institutes which did not require a PhD at the time when they were hired. This practice has now ceased).

The CVs of existing staff demonstrate very good evidence of appointed academic staff having prior and relevant teaching and research experience in other higher education institutions. Research expertise and publication records are relevant and consistent to the program of study.

There is a student survey which gathers student feedback which is being used for staff evaluation purposes but not used as part of the annual program of study review and self-assessment. There are no teaching and observation peer review procedures.

As a whole, the teaching staff is highly commended by the students. However, students have pointed out the lack of female academic staff as a weakness.

Strengths
A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

The staffing base and the low number of students have contributed to an excellent Student-Staff Ratio (SSR) that is less than 10. Staff expertise is consistent with the program of study and it seems that they receive appropriate support to undertake research. This is evident by the strong research output of the staff involved in this program.

Areas of improvement and recommendations
A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

The EEC has identified lack of training support and therefore, it recommends the development of systematic central support menu with regards to staff induction, mentoring and further development. The EEC has also realised that there are no procedures for staff peer review and therefore it recommends for the development and implementation of a relevant procedure. In particular, a minimum of didactic & pedagogical training should be compulsory to all staff. This is the reason why teaching staff development is assessed as partially compliant.

Finally, the EEC recommends that targeted efforts are made to recruit female academic staff of high scientific calibre.

Please select what is appropriate for each of the following sub-areas:

Sub-area		Non-compliant/ Partially Compliant/Compliant
3.1	Teaching staff recruitment and development	*Partially Compliant*
3.2	Teaching staff number and status	*Compliant*
3.3	Synergies of teaching and research	*Compliant*

4. Student admission, progression, recognition and certification *(ESG 1.4)*

> **Sub-areas**
>
> 4.1 **Student admission, processes and criteria**
> 4.2 **Student progression**
> 4.3 **Student recognition**
> 4.4 **Student certification**

4.1 Student admission, processes and criteria

Standards

- *Pre-defined and published regulations regarding student admission are in place.*
- *Access policies, admission processes and criteria are implemented consistently and in a transparent manner.*

4.2 **Student progression**

Standards

- *Pre-defined and published regulations regarding student progression are in place.*
- *Processes and tools to collect, monitor and act on information on student progression, are in place.*

4.3 Student recognition

Standards

- *Pre-defined and published regulations regarding student recognition are in place.*
- *Fair recognition of higher education qualifications, periods of study and prior learning, including the recognition of non-formal and informal learning, are essential components for ensuring the students' progress in their studies, while promoting mobility.*
- *Appropriate recognition procedures are in place that rely on:*
  - *institutional practice for recognition being in line with the principles of the Lisbon Recognition Convention*

> ○ *cooperation with other institutions, quality assurance agencies and the national ENIC/NARIC centre with a view to ensuring coherent recognition across the country*

4.4 Student certification

Standards

- *Pre-defined and published regulations regarding student certification are in place.*
- *Students receive certification explaining the qualification gained, including achieved learning outcomes and the context, level, content and status of the studies that were pursued and successfully completed.*

You may also consider the following questions:

- *Are the admission requirements for the study programme appropriate? How is the students' prior preparation/education assessed (including the level of international students, for example)?*
- *How is the procedure of recognition for prior learning and work experience ensured, including recognition of study results acquired at foreign higher education institutions?*
- *Is the certification of the HEI accompanied by a diploma supplement, which is in line with European and international standards?*

Findings
A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

The Master in Data Science and Engineering started enrolling students in 2015. After two initial years, during which the number of students who started the programme was in line with the expectations (18 and 17, respectively), the number of enrolled students decreased significantly, reaching its minimum in 2018 when only 3 students enrolled. After this minimum, the number is constantly and slowly increasing, thus denoting that, after an initial fluctuation, the population of students interested in the Master is stabilizing. This is also confirmed by the fact that a significant percentage of the students enrolled during the initial years left the programme, while the students who started in the last years are completing their studies in, more or less, 2.5 years.

Another aspect related with the enrolled students is concerned with the lack of balance between male and female students. This is a well known problem in STEM (Science, Technology, Engineering, Maths) disciplines, but in this Master the unbalance appears particularly pronounced (15 female and 61 male).

An interesting aspect of this Master, as well as of all the masters in data science, is concerned with the heterogeneity of the enrolled students. In fact, a master in data science is of interest not only for students with a bachelor in Computer Science or Engineering, but also in other disciplines like Mathematics, Physics, or more applied sciences like Social or Economic Sciences. This aspect is at the same time a source for possible problems, e.g. possible lack of knowledge of some student in some specific area, as well as a richness, e.g. phenomena of cross fertilization among the students with different backgrounds. The impression given to the evaluation committee during the on-site visit (for instance, during the interview with the students the committee had the possibility to discuss with a student with previous studies in Physics) is that the admission procedures have been designed to successfully cope with the possible problems indicated above, in that the students with lack of knowledge are guided, since their enrollment, by giving them advice and teaching material to be used to cover such gaps.

Strengths
A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

A strong point of the Master is concerned with a well balanced mixture of foundational and applied studies. Some specific courses include practical activities in which state-of-the art technologies are learned and tested, and such knowledge is evaluated by means of project work. Other courses are focused on more scientific activities, like writing a scientific paper, and the acquisition of this ability is tested by giving the possibility to the students to write their master thesis in the form of a scientific paper.

Another related strong point is concerned with the employability of the students who completed the Master. According to the data reported in the application, all the graduated students (21) are employed in professions in which they studied, and some of them (4) were employed abroad.

A weak point is concerned with a very high percentage of students who withdrew, especially during the initial years of the Master (among the students enrolled during the initial year, one third left the programme). The impression is that in more recent years this percentage decreased, but the evaluation committee considers the number of students who drop out a critical point to be carefully monitored.

Areas of improvement and recommendations
A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

The evaluation committee thinks that an area of improvement of the Master is concerned with the number, quality and gender balance of the admitted students. Given the worldwide high-interest in data-science (many of the new IT professions are in the data science area), more motivated students could be enrolled by switching from greek to english. This could also give a more international flavour to the master. Another way to improve the population of students, is to try to increase the number of female students: the evaluation committee suggests to faculty to take some specific action to make the programme more attractive to women.

Another recommendation for attracting motivated students is concerned with the possibility to personalize the curriculum of studies. The current structure of the programme includes all compulsory courses, excluding only one

elective course. Typically, students with high scientific and technological skills, also have specific interests; giving the possibility to customize the studies, or proposing alternative curricula, could be a way to attract them.

Another area of improvement is concerned with the percentage of students who withdrew, and the urgent need for a structured process to monitor and improve this. This is the reason why the student progression standards are partially met. Note that the statistics on student numbers that were submitted as part of the department's application were different to the statistics that were given by the department after the on-site visit following a request by the EEC. The evaluation committee suggests that the faculty formalizes a specific quality assurance process, having a particular focus on this aspect. Some metrics or KPIs should be identified and monitored with a predefined timing during the academic year. Specific documents, that follow a predefined format, should be periodically edited, by reporting comments of the metrics as well as indicating specific actions to be taken to improve (when possible) the monitored situation. Processes of this type are already among the implicit "good practices" of the Master, but the suggestion is to make this quality assurance process formalized and explicit, and to make sure that the correct statistics are always easily accessible.

Please select what is appropriate for each of the following sub-areas:

Sub-area		Non-compliant/ Partially Compliant/Compliant
4.1	Student admission, processes and criteria	*Compliant*
4.2	Student progression	*Partially compliant*
4.3	Student recognition	*Compliant*
4.4	Student certification	*Compliant*

ΔΙΠΑΕ CYQAA

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5. Learning resources and student support *(ESG 1.6)*

Sub-areas

    5.1 **Teaching and Learning resources**
    5.2 **Physical resources**
    5.3 **Human support resources**
    5.4 **Student support**

5.1 Teaching and Learning resources

Standards

- *Adequate and readily accessible teaching and learning resources (teaching and learning environments, materials, aids and equipment) are provided to students and support the achievement of objectives in the study programme.*
- *Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).*
- *All resources are fit for purpose.*
- *Student-centred learning and flexible modes of learning and teaching, are taken into account when allocating, planning and providing the learning resources.*

5.2 Physical resources

Standards

- *Physical resources, i.e. premises, libraries, study facilities, IT infrastructure, are adequate to support the study programme.*
- *Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).*
- *All resources are fit for purpose and students are informed about the services available to them.*

5.3 Human support resources

Standards

- *Human support resources, i.e. tutors/mentors, counsellors, other advisers, qualified administrative staff, are adequate to support the study programme.*
- *Adequacy of resources is ensured for changing circumstances (change in student numbers, etc.).*
- *All resources are fit for purpose and students are informed about the services available to them.*

5.4 Student support

Standards

- *Student support is provided covering the needs of a diverse student population, such as mature, part-time, employed and international students and students with special needs.*
- *Students are informed about the services available to them.*
- *Student-centred learning and flexible modes of learning and teaching, are taken into account when allocating, planning and providing student support.*
- *Students' mobility within and across higher education systems is encouraged and supported.*

You may also consider the following questions:

- *Evaluate the supply of teaching materials and equipment (including teaching labs, expendable materials, etc.), the condition of classrooms, adequacy of financial resources to conduct the study programme and achieve its objectives. What needs to be supplemented/ improved?*
- *What is the feedback from the teaching staff on the availability of teaching materials, classrooms, etc.?*
- *Are the resources in accordance with actual (changing) needs and contemporary requirements? How is the effectiveness of using resources ensured?*
- *What are the resource-related trends and future risks (risks arising from changing numbers of students, obsolescence of teaching equipment, etc.)? How are these trends taken into account and how are the risks mitigated?*
- *Evaluate student feedback on support services. Based on student feedback, which support services (including information flow, counselling) need further development?*
- *How is student learning within the standard period of study supported (student counselling, flexibility of the study programme, etc.)?*

- *How students' special needs are considered (different capabilities, different levels of academic preparation, special needs due to physical disabilities, etc.)?*
- *How is student mobility being supported?*

Findings
A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

The EEC was virtually guided through the Department, observing the resources and facilities, and asking questions from the members of academic and administrative staff and students. The overall perception is that the Department has adequate resources and infrastructure to meet the present requirements. The department is effective and professional in its learning and teaching activities.

As the student number in the programme is small, the teaching rooms are suitable for theoretical, practical and laboratory lessons. The teaching staff of the Department provides timely and effective feedback to their students. The special teaching staff and special scientists have the required qualifications, sufficient professional experience and expertise to teach a limited number of programmes of study. As evident by their CVs, the scientific merits of the staff are of high standards. Physical resources and support services to the student are adequate. It is worth noting that during the pandemic period when the University premises were closed, the teaching was not influenced as the proper infrastructure was in place to support the remote teaching.

Strengths
A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

The programme has a very good structure and support. Administrative staff is well organised and provides high quality support. The Department is well managed and resources are adequately used to provide excellent quality of services and outputs. The academic faculty is a united and cohesive group working together to advance the quality of research and teaching in the department. The small size of the department allows for effective informal solutions to operations issues. Students are highly satisfied with the quality of learning and teaching resources. Staff expertise and relevance to the program of study and department. A key strength in the department's learning and teaching activities is the academic support given to students throughout their studies.

Areas of improvement and recommendations
A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

It is highly recommended to ensure the continuous funding of the infrastructure that supports the programme. This includes lab infrastructure and relevant to the programme software. It seems that the University does not have sufficient financial resources to guarantee this.

It is important to improve teaching with external visiting staff to enrich teaching and connect it with the industry.

Students should be encouraged to familiarise themselves with cloud providers and state of the art infrastructures, such as training Machine Learning models on GPUs, not only as part of their theses, but also during their courses.

The allocated resources for funding the infrastructure and for the operation of the department and the continuous improvement of the quality of its programmes of study need to be reevaluated.

Please select what is appropriate for each of the following sub-areas:

Sub-area		Non-compliant/ Partially Compliant/Compliant
5.1	Teaching and Learning resources	*Compliant*
5.2	Physical resources	*Compliant*
5.3	Human support resources	*Compliant*
5.4	Student support	*Compliant*

6. Additional for doctoral programmes *(ALL ESG)*

> **Sub-areas**
>
> 6.1 **Selection criteria and requirements**
> 6.2 **Proposal and dissertation**
> 6.3 **Supervision and committees**

6.1 Selection criteria and requirements

Standards
- *Specific criteria that the potential students need to meet for admission in the programme, as well as how the selection procedures are made, are defined.*
- *The following requirements of the doctoral degree programme are analysed and published:*
  - *the stages of completion*
  - *the minimum and maximum time of completing the programme*
  - *the examinations*
  - *the procedures for supporting and accepting the student's proposal*
  - *the criteria for obtaining the Ph.D. degree*

6.2 Proposal and dissertation

Standards
- *Specific and clear guidelines for the writing of the proposal and the dissertation are set regarding:*
  - *the chapters that are contained*
  - *the system used for the presentation of each chapter, sub-chapters and bibliography*
  - *the minimum word limit*
  - *the binding, the cover page and the prologue pages, including the pages supporting the authenticity, originality and importance of the dissertation, as well as the reference to the committee for the final evaluation*
- *There is a plagiarism check system. Information is provided on the detection of plagiarism and the consequences in case of such misconduct.*
- *The process of submitting the dissertation to the university library is set.*

6.3 Supervision and committees

Standards
- *The composition, the procedure and the criteria for the formation of the advisory committee (to whom the doctoral student submits the research proposal) are determined.*

- *The composition, the procedure and the criteria for the formation of the examining committee (to whom the doctoral student defends his/her dissertation), are determined.*
- *The duties of the supervisor-chairperson and the other members of the advisory committee towards the student are determined and include:*
  - *regular meetings*
  - *reports per semester and feedback from supervisors*
  - *support for writing research papers*
  - *participation in conferences*
- *The number of doctoral students that each chairperson supervises at the same time are determined.*

You may also consider the following questions:

- *How is the scientific quality of the PhD thesis ensured?*
- *Is there a link between the doctoral programmes of study and the society? What is the value of the obtained degree outside academia and in the labour market?*
- *Can you please provide us with some dissertation samples?*

Findings

A short description of the situation in the Higher Education Institution (HEI), based on elements from the application for external evaluation and on findings from the onsite visit.

Click or tap here to enter text.

Strengths
A list of strengths, e.g. examples of good practices, achievements, innovative solutions etc.

Click or tap here to enter text.

Areas of improvement and recommendations
A list of problem areas to be dealt with, followed by or linked to the recommendations of how to improve the situation.

Click or tap here to enter text.

Please select what is appropriate for each of the following sub-areas:

Sub-area		Non-compliant/ Partially Compliant/Compliant
6	Selection criteria and requirements	Choose answer
6.2	Proposal and dissertation	Choose answer
6.3	Supervision and committees	Choose answer

D. Conclusions and final remarks

Please provide constructive conclusions and final remarks which may form the basis upon which improvements of the quality of the programme of study under review may be achieved, with emphasis on the correspondence with the EQF.

The EEC reviewed and examined the materials provided by the Cyprus University of Technology pertaining to its Master's Degree Program in Computer Engineering and Informatics of the Department of Electrical Engineering, Computer Engineering and Informatics. The one-day site visit was held on 17.6.2021.

The EEC was presented with detailed information about the degree program. During the site visit, the EEC met university, school and department leadership peers and met professors, teachers and administrators. It also met current and past students of the program.

Based on the examination and evaluation of the accreditation materials and the remote site visit, the EEC concludes that the required standards are met fully, with the exception of staff development and student progression, which are partially met.

The EEC identified the following key strengths:

- This programme adheres to international standards with respect to topics, quality of teaching, resources and infrastructures.
- The department maintains a national strength in research, and integrates research activities into teaching.
- The students on the programme have been well looked after, particularly during the Covid-19 pandemic.
- The programme enjoys a good staff-student ratio, which means that each student can get sufficient support.
- Staff expertise is consistent with the program of study and it seems that they receive appropriate support to undertake research. This is evident by the strong research output of the staff involved in this program.
- There is a well balanced mixture of foundational and applied topics in this MSc programme.
- The employability of the students who completed the programme is very high.
- The programme has a very good administrative and managerial structure and support.
- The small size of the department allows for effective informal solutions to operations issues.
- Students are highly satisfied with the quality of learning and teaching resources.

The EEC also identified a number of key areas for improvement and therefore, the following recommendations are made:

- The EEC recommends that the department carries out regular and formal course reviews, the aggregated results of which are fed back to the students (anonymously).
- The EEC recommends that the department carries out formal moderation to the assessment and marking.
- The EEC recommends that student feedback mechanisms are provided to students at the programme level.
- The EEC has identified lack of training support for staff and therefore recommends the development of a systematic central support menu with regards to staff induction, mentoring and further development. The EEC recommends that a minimum of didactic & pedagogical training should be compulsory to all staff.
- The EEC recommends that targeted efforts are made to recruit female academic staff of high scientific calibre.
- The EEC recommends that the number and gender balance of admitted students and student dropout should be monitored precisely and and should be subject to a targeted strategy aiming to improve it.
- The EEC recommends that the department ensures the continuous funding of the infrastructure that supports the programme. This includes lab infrastructure and relevant to the programme software.
- The EEC recommends that the department continues to improve teaching with external visiting staff and connections with industry.

E. Signatures of the EEC

Name	Signature
Christina Lioma	
Zhiguo Ding	
Gianluigi Zavattaro	
Christos Charalambous	
Chrysovalantis Christodoulou	

Date: 30 June 2021