

Doc. 300.1.1

Date: 2 February, 2024

External Evaluation Report

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

- **Higher Education Institution:**

The Cyprus Institute

- **Town:** Nicosia

- **School/Faculty (if applicable):**

- **Department/ Sector:** The Cyprus Institute Graduate School/ Private Institute of Tertiary Education

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

In Greek:

In English:

Master's in High Performance Computing and
Machine Learning (1 Academic Year, 90 ECTS, Master's
(MSc))

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



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 2021 [L.136(I)/2015 – L.132(I)/2021].

- **Programme’s status:** Currently operating program of study
- **Concentrations (if any):**

In Greek:

In English: English



A. Introduction

This part includes basic information regarding the onsite visit

The visit to the Cyprus Institute took place on Thursday, 1 February 2024, 0900 - 17h00 with all members of the EEC listed below present and accompanied by Ms Natasa Kazakaïou, CYQAA. The visit was well-organised and represented by members of the Management Team, Teaching Faculty and Research and Administration staff, and the student body, including current and past students.

Cyprus Institute is a non-profit institution which engages in research and teaching and operates under the aegis of the Cyprus Research and Educational Foundation (CREF). The Institute is organised as four Research Centres: The Energy, Environment and Water Research Center (EEWRC); The Science and Technology in Archaeology and Culture Research Center; The Climate & Atmosphere Research Centre (CARE-C); and, The Computation-based Science and Technology Research Center (CaSToRC). The Graduate School is a central department which co-ordinates the delivery of the Doctoral and Master's programme offered by members of each Institute.

Executive Summary

The purpose of the visit was to evaluate the proposed new Programme of Study in High Performance Computing and Machine Learning, which is a successor to the MSc Degree in Simulation and Data Science, offered by the staff of CaSToRC.

The Cyprus Institute houses the national High Performance Computing Centre in Cyprus. The CaSToRC staff have expertise in Computational Science, High Performance Computing and Machine Learning, all topics which are currently in vogue and in high demand.

CaSToRC has a thriving research and doctoral programme with all PhD students supported financially, and external collaboration with the University of Illinois at Urbana Champaign, USA.

It is therefore surprising and a matter of concern that the student numbers are low and are falling in the last two years in the current MSc programme.

The content of the programme should reflect a balance between Computational Science/High Performance Computing and Machine Learning.

Particular attention and resources should be directed at marketing the programme strategically to students in a catchment area within 3-4 hours flying distance of Cyprus.

The External Evaluation Committee (EEC) recommends that the Institute management produce a strategic plan for expansion of the MSc programme over the next 5 years (in conjunction with their plans for increasing Faculty and doctoral student numbers over the same period) which is monitored at regular intervals to realise the enormous potential for the proposed MSc programme.



B. External Evaluation Committee (EEC)

<i>Name</i>	<i>Position</i>	<i>University</i>
D K Arvind	Professor	University of Edinburgh, Scotland, UK
Christina Lioma	Professor	University of Copenhagen, Denmark
Giuseppe Di Fatta	Professor	Free University of Bozen-Bolzano
Marilena Lemonari	Doctoral student	University of Cyprus
Name	Position	University
Name	Position	University



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

1.2 Design, approval, on-going monitoring and review

Standards

- *The programme of study:*
 - o *is designed with overall programme objectives that are in line with the institutional strategy and have explicit intended learning outcomes*
 - o *is designed by involving students and other stakeholders*
 - o *benefits from external expertise*
 - o *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)*



- o *is designed so that it enables smooth student progression*
- o *is designed so that the exams' and assignments' content corresponds to the level of the programme and the number of ECTS*
- o *defines the expected student workload in ECTS*
- o *includes well-structured placement opportunities where appropriate*
- o *is subject to a formal institutional approval process*
- o *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*
- o *is regularly monitored in the light of the latest research in the given discipline, thus ensuring that the programme is up-to-date*
- o *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*
- o *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:*
 - o *selection criteria*
 - o *intended learning outcomes*
 - o *qualification awarded*
 - o *teaching, learning and assessment procedures*
 - o *pass rates*
 - o *learning opportunities available to the students*
 - o *graduate employment information*

1.4 Information management

Standards

- *Information for the effective management of the programme of study is collected, monitored and analysed:*
 - o *key performance indicators*
 - o *profile of the student population*
 - o *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/courses 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.

Overall, the programme meets the quality conditions and expectations for a Higher Education Institution in Cyprus and at the European level.

The proposed Master's (MSc) programme in "High Performance Computing and Machine Learning" is an evolution of the existing MSc programme in "Simulation and Data Science" with a more prominent focus on Machine Learning, as indicated in the title and achieved with new specific courses.

The institute has a policy for quality assurance (QA), which has a formal status and is publicly available to all on the institute's website. There are appropriate structures, regulations and processes in place to support the implementation of this policy for QA. Overall, this policy supports teaching and students to take on their responsibilities in QA; administrative staff is also supported in this respect, but to a lesser extent (we discuss this later in this section). The involvement of external stakeholders in QA is limited (we also discuss this later).

The programme is subject to a formal institutional approval process, however students' involvement in this process should be strengthened (we discuss this later in this section). The programme's objectives are in line with the institutional strategy and have explicit intended learning outcomes. The programme reflects the four purposes of the higher education of the Council of Europe. Smooth student progression is enabled by the programme design. Exams and assignments correspond to the level of the programme and the number of ECTS. The programme includes well-structured placement opportunities. The programme results in a qualification that is clearly specified and communicated. There are processes for reviewing and revising the programme regularly.

Information regarding the programme of study is clearly communicated on the institute's website, with respect to selection criteria and qualification awarded. The intended learning outcomes and the teaching, learning and assessment procedures are specified per course, but not for the programme as a whole. Graduate employment information is provided in the form of career paths, not statistics of alumni employability. Information on pass rates is missing (we discuss this later in the section).

Information for the effective management of the programme is collected, monitored and analysed, however more effort should be made towards increasing student intake (we discuss this later in section 3).

The list of compulsory courses seems rather weak in terms of Machine Learning content, resulting in an imbalance in the focus of the programme. The change in the proposed title should be better represented in the content of compulsory courses.

From the discussions with the coordinator and the staff members it is clear that there is a desire to maintain some of the previous focus on HPC and Computational Science while introducing modern Machine Learning approaches that can have a general purpose, not only for applications to Computational Science problems. Another interesting and innovative aspect to be considered is that modern Deep Learning technologies are enabled by HPC infrastructures. In this regard, the Institute is in a privileged position to offer a unique selling point in terms of both competencies and teaching offer with a specific HPC approach to ML. For example, the introduction of a specific new course on "High Performance Machine Learning" may provide a perfect link between the two fields represented in the title as well as a unique selling point with respect to other local programmes in the area of Machine Learning.



Strengths

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

The programme design has benefited from external expertise in the form of market-driven suggestions, which pointed to the increased involvement of SMEs & industry, as well as increased focus on ML/AI as this is a main priority for the national economy and society. The Management and Innovation Office (MIO) of the institute (established in 2020) is expected to further support this direction. The MIO is in contact with more than 100 SMEs or industries in Cyprus, maintains a database of industry and government contacts (allowing for targeted scouting), and coordinates training events on HPC and AI for both students and broader audiences. These initiatives are commendable.

The programme was redesigned to meet not only the expectation for a continuation towards a PhD programme possibly at the Institute, but also to meet local and international employment conditions that require modern ML expertise. Graduates of the new programme are expected to have excellent employability.

The programme appropriately leverages the existing competencies in Computational Science and HPC, while integrating the growing interest in Machine Learning indicated by the new appointments and clearly expressed by staff members and current and past students.

The Institute has been very successful in attracting external research funding and has high academic standards and demonstrated strong links to industry.

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 institute's QA policy supports administrative staff to take on their responsibilities in QA only through their participation in two committees: the Administrative Committee (which reports to the Associate Provost and which is responsible for the operation of the Graduate School through the development and implementation of an annual workplan with deliverables and key performance indicators), and the Erasmus Committee (which reports to the Dean and which focuses on Erasmus related issues). Administrative staff is represented in the Administrative Committee by one member, who is the Finance and Account Manager. Administrative staff is represented in the Erasmus Committee by one member from the administration.

Therefore, in the current structure, the only opportunity for the administrative body to elect their own representative in QA is through their participation in the Erasmus committee. The scope of that committee is limited to Erasmus related issues. The EEC recommends that administrative staff be represented more strongly in the committees that report directly to the Provost or Associate Provost, and that this representation be not by appointment according to their specific position in the administration, but by self-election from the administration staff.

The EEC recommends that the following information be specified in the QA policy of the institute:

- The length of term for each member in each committee
- The frequency of meetings for each committee



- Information on the minimum number of members who must be present, in order for the committee meeting to take place

In addition, the EEC recommends that the presence of the student representative in committees that include a student member be compulsory in order for a committee meeting to take place, to ensure that student representation is actively enforced at all times.

There is a Disciplinary committee in place that, according to the institute's QA policy: "is involved in the disciplinary procedure only if it is decided by senior management in order to address a disciplinary offence". The EEC recommends that this phrasing be amended in order to clarify precisely a) who in the senior management makes this decision, and b) that, prior to investigation by the Disciplinary committee, the event should be described as an incident, or suspected disciplinary offence. The EEC further recommends that the description of the Disciplinary committee's role in the QA policy makes explicit mention of the committee's commitment to i) guard against intolerance of any kind or discrimination against students or staff, and ii) be vigilant against academic fraud. The EEC recommends that vigilance against academic fraud be further supported by amending the description of the Academic committee's role in the institute's QA policy, in order to state explicitly the committee's role in ensuring academic integrity and freedom.

The EEC recommends that the institute's QA policy be amended in order to specify precisely what is the composition, duration of term and frequency of meetings of the School Council.

External stakeholders are not involved as members in any of the institute's committees that are included in the QA policy, or in any other advisory role specified in the QA policy. The institute's QA policy states that external quality assurance is supported by CY.Q.A.A. and that the Educational Quality Management System (EQMS) of the institute, which is their official resource on QA, is public and well communicated to external stakeholders. The EEC recommends that external stakeholders, other than CY.Q.A.A., such as external academic, research, industrial, technological, societal and other relevant partners are carefully selected and invited to provide input to the programme of study. From discussions with the programme coordinator, it appears that this practice has already taken place for the programme under assessment. The committee applauds this, and recommends that initiatives along this line be done, not in an ad hoc way, but as part of the institute's formal QA policy, which should be amended to explicitly support the involvement of such external stakeholders through appropriate formal structures.

While the programme's design benefited from input from academics (including newly hired) and industry, student input was limited to the single student member of the Internal Quality committee, as per the QA policy of the institute. Faculty members stated that they also considered student feedback on existing courses or programmes (from questionnaires) when designing the programme. The EEC recommends that student involvement in the programme design and revision be further strengthened, for instance via focus groups, interviews and open floor discussions.

Student workload is specified in terms of ECTS. Course descriptions include the amount and duration (in hours) of lectures per week, and the amount and duration (in hours) of labs per week. The total number of weeks of each course is not always stated. The EEC recommends that the total expected student workload is also included (to clarify the convergence to ECTS), broken down as follows:



- Number of total lecture hours
- Number of total preparation hours
- Number of total hours spent in coursework
- Number of total hours spent in exam preparation
- Number of total hours spent in exam

This point should be amended for all courses. In addition, all courses should state the pass rates.

There is an insufficient number of compulsory courses in Machine Learning/AI. It is recommended to offer some of the elective courses (e.g., Deep Learning) as mandatory to rebalance the programme.

The EEC suggests the introduction of a specific new course on "High Performance Machine Learning" to provide a link between the two fields represented in the proposed title as well as a unique selling point with respect to other local competitor programmes in the area of Machine Learning.

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

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
1.1	Policy for quality assurance	Partially 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 particularly low student-staff ratio allows for an excellent learning experience. Students can interact directly with the lecturers and have the opportunity to ask for specific support. Teaching and Learning (T&L) practices are adequate and of a high standard.

Whereas the assessment for exams seems to be properly managed with a deadline to return the results, a formal deadline for returning marks and feedback for coursework is not in use. In the assessment of coursework there is not always written feedback.

Currently there is no internal and no external moderation of the assessment both during preparation and after marking. It is noticed that there is the intention to introduce external moderation of the results of the exam scripts. An internal moderation of the preparation of the assessment elements and the model answers can be particularly useful to improve the overall quality of the assessment and the student experience (e.g., better clarity of the questions, marking scheme).

Strengths

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

External moderation of the assessment will be implemented.

Student mentoring works well as reported by both staff and students.

The proposed mandatory industrial training in an external organisation provides practical experience and complements the academic training at the Institute.

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 recommends the introduction of deadlines to return coursework marks and feedback, and to make it compulsory to write some written feedback along with marks in coursework and midterm exams.
The EEC recommends the Introduction of internal peer moderation of exam papers and to provide model answers.

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

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
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



- *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.

Cyprus's strategic location in the eastern Mediterranean within 3-4 hours flying distance from large population centres in Europe, Middle East and North Africa should be viewed as potential recruiting areas. Cyprus has a population with English being widely spoken and understood, which makes this country an attractive destination for students wishing to pursue higher degrees.

The teaching staff of the programme consists of either faculty members or teaching researchers. Teaching researchers are not obliged to teach, but they may choose to do so. Overall, teaching load is less than 30% of the teaching staff time, on average, meaning that no one teaches more than one course per semester in practice. This allocation of teaching hours compared to the time for research activity is appropriate.



In the graduate school, there are a total of 51 faculty members (incl, 10 visiting or adjunct), 70% of whom are international: 30 professors, 14 associate professors, and 7 assistant professors. The student to faculty ratio is 2:1. In addition, there is regular visiting faculty (3-4 per year) from the University of Illinois at Urbana-Champaign.

Overall, 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.

The teaching staff collaborate in the fields of teaching and research within the institute and with partners outside. There is substantial scholarly activity to strengthen the link between education and research.

Faculty has been traditionally strong mainly in HPC and computational physics. Recent hirings have added strength in computational science and engineering, Machine Learning and AI. The teaching staff publications are within the discipline, and the teaching staff studies and publications are closely related to the programme courses. Overall, the teaching staff qualifications are more than adequate to achieve the objectives and planned learning outcomes of the programme, and to ensure quality and sustainability of teaching and learning.

The processes for recruiting teaching staff are overall clear and fair.
The ratio of female to male is 1:13 in the teachers for the proposed programme.

Strengths

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

The scientific profiles of the teaching staff are overall strong in research. There are opportunities for hands-on collaboration between MSc students and the institute labs.

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 low student-staff ratio which is presented as a virtue is the result of declining student numbers in the last 2 years. This needs to be addressed urgently. Currently, the MSc programme is viewed primarily as a recruiting ground for the PhD programme. This need not be at the exclusion of offering the MSc degree as an end in itself for students who wish to crossover from other STEM disciplines or gain specialist training in this area. A market-led degree, which combines elements of Computation Science, High-performance Computing and Machine Learning, and which is badged appropriately and marketed attractively will almost certainly be successful in attracting larger student numbers than hitherto has been the case. The academics will also have a larger pool from which to select doctoral students which seems to be an important concern.

The EEC recommends the introduction of formal pedagogical and didactic training and development for all teaching staff. Currently there is a mentor scheme for new faculty, who are partnered with more senior faculty in order to



receive general guidance and mentorship. This is commendable, however training by experts in university pedagogics should be introduced.

Not all teaching staff (faculty and researchers) have their CVs on the institution's website. The EEC recommends that this is amended.

The current gender imbalance in the student population should be addressed.



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

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
3.1	Teaching staff recruitment and development	Non-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*

- ο *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 students admitted to this programme come from a variety of backgrounds (i.e., Mathematics, Computer Science, Natural Sciences, Engineering). Strong foundations in mathematics and computer science is sought since prerequisites for some courses (Computational Modelling and Algorithms, Introduction to High Performance Computing) require "Undergraduate-level courses in linear algebra, calculus and differential equations", and programming languages such as C and python. The diverse background of the recruits both encourages the multidisciplinary exchange of ideas and ways of thinking, especially in group discussions and projects, but also poses challenges in covering different kinds of gaps, e.g., a Mathematics graduate could excel in statistical courses but have difficulty keeping up with coding in specific programming languages. Students with weaker coding backgrounds still get the opportunity for a smooth transition into the programme via the introductory lectures and labs on the



required programming languages, in their respective courses. In some cases, students are able to apply for internship positions at the Institute, prior to the start of the Master's programme, thus gaining valuable knowledge and skills to complement their undergraduate experience. The admission criteria do not include a minimum classification or grade. This was intentional since, as part of the Institute's vision to attract international students, they favour assessing their prospective students' degrees on a case-by-case basis and also interview them to gain insight into their capabilities, yielding ~20% acceptance rate. The application review process is clear and considers candidates fairly by having the most suitable faculty members as reviewers, and an interview segment.

Student progression regulations are easily accessible via the Student Handbook. Having a mentoring scheme also encourages conversations leading to more transparency regarding such regulations. Students have feedback and access to their marked coursework and exams, resulting in a transparent and constructive assessment policy. In regard to this, the student evaluation questionnaire (evaluation of programme, course, and instructors) is taken into account by the faculty to introduce minor modifications to the courses that comply with students' feedback and needs.

Student feedback reveals interest in additional Machine Learning experience through either more intense courses or more relevant elective course options.

The Institute focuses on alleviating any form of discrimination which is reflected in their admission policies and recognition of students' previous qualifications/experiences. As mentioned before, the interview segment of the application process gives fair opportunities to all students to showcase their strengths, should those come from previous qualifications, formal or non-formal experience. The Institute follows an intense mobility schedule both encouraging international candidates and providing significant experiences to students with various opportunities like Erasmus+. However, most of these opportunities are explored by PhD students instead of MSc students in light of time restrictions. Still, discussing with students revealed cases of external collaborations e.g., with the University of Athens.

Learning outcomes are clearly explained for each course that match the taught syllabus and reported gained qualifications. Regulations for student certification, diploma supplement, and transcripts are in place.

Strengths

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

The flexibility to offer online interviews during the application process is inclusive and could attract a more diverse pool of candidates. Students admitted to the programme may have the opportunity to serve as interns in the preceding summer. Also, during the academic year it is possible to attend several transferable skills courses that include, for example, an introduction to python. The topics of these courses were decided based on student demand and are thus tailored to their needs.

The cross-registration agreement with the University of Cyprus, along with other organized events such as the Students' club meetings are opportunities that broaden the understanding of students and enhance their adjustment skills, and eventually ease their progression.



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 application procedure for student admittance to the programme contains the following research elements:

- Applicants are expected to submit a statement of intent, which in point 4(b) states: "Look on the web at professors and their research. Look specifically for professors whose research interests are aligned with yours and indicate it."
- The Review and Selection Process includes the following: "The Admissions Committee reviews applications and makes its decision on the basis of the student's academic merit and the match between the Institute's research activities and the student's research interests".

Requiring Bachelor's graduates to indicate faculty research interests that are aligned with their own assumes that these graduates are already well acquainted with research and can exercise some level of critical thinking across research areas. Similarly for the expectation that applicants should already have decided on their own research interests, and that their admittance to the programme depends on the match between the institute's research activities and the applicants' own research interests. The above should be expected from Master's graduates, but not from Bachelor's graduates. The EEC finds this expectation unsuitable as part of the process for admitting students to this MSc programme. While graduates of this programme may proceed into research, not all of them should be assumed to be on that path, and the process for student admittance should reflect this.

The number of international students should be increased by developing and adopting a marketing strategy. For example, the strong reputation and relation with some research partners should be leveraged, some relevant overseas Departments and BSc programmes should be identified as potential targets for an advertisement campaign.



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

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



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.

Overall, students receive high-quality theoretical and practical training in key areas targeted by the programme. Adequate and modern learning resources are available to the students, including the following: social facilities, library, computing infrastructure, student welfare, academic mentoring. All facilities are fit for purpose to achieve the course learning outcomes with a student-centred approach.

Course material and relevant suggested bibliography are readily available. The learning resources include lecture notes, lab sessions, academic articles, physical and online books (libraries). Most resources and materials can be found online providing distant and 24/7 access. Institute Facility is also equipped with the necessary inventory to support such a computationally heavy programme, e.g., Phi Clusters used for training and teaching purposes. For the current student body, resources can serve all of them adequately and relatively quickly since the cluster has a reserved part for Institute students exclusively. Longer queues are observed during the master thesis projects, but still, priority is given based on urgency. The level of computation resources of the Institute is high as the HPC Facility serves the needs of other research centers as well and aims to maintain a state-of-the-art and unique infrastructure. According to students, both the facility services and the libraries (UCY and Institute) are utilized by them almost daily. Some students would like the opportunity to gain more hands-on experience with the HPC facility, by being able to physically visit and discuss with the professional personnel.

Classrooms are small but appropriate for the current number of students; however, they should plan for future growth in student numbers. Study rooms are also available at the Graduate School on a first-come, first-served basis but students have the option to visit the UCY library rooms as well, since they have access, and it is nearby. UCY Library gives the option of 24h access. There is no dedicated Students Information System, such as Moodle, which is necessary for management and streamlining purposes.

Qualified personnel on various levels, e.g., supervisors and tutors constitute the human support resources, and the student handbook acts as a guide to the different types of support sources. The small number of students enhances the personal communication and relationships with their peers, teaching staff, and administrative staff enabling open discussions and constructive support. Students come in contact with alumni that pursued their PhD after the completion of this master. This is beneficial since a significant portion of them want a future in academia. However, there is no career counselor on site.

Graduate school ensures the inclusion of people with disabilities as well as international students. However, a part-time option is not currently available making it difficult for employed students to find a work-to-studies balance and possibly limits the number of applicants. Students are heavily involved in choosing their supervisor and thesis project as well as internship company. During their Master's thesis, students are encouraged to participate in group meetings with their supervisor's teams but also have conversations with other professors or researchers, should they deem it appropriate for their progression.



Strengths

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

The structure of the programme of study and its delivery is in accordance with that of the institution's standards. Students appear very satisfied with the programme, the teaching staff, and their interactions with the teaching staff. All regulations supporting student progress and a student tutoring system are in place.

The Institute connections have significant impact on the resources available to students through access to the electronic library of the University of Illinois, and the University of Cyprus library; local library resources and archives are also available (e.g., the Leventis Municipal Museum). This spans a large range of accessible material such as journals, books, etc. Also, students have access to the state-of-the-art infrastructure of the HPC facility.

Institute buildings are located near the UCY campus further encouraging the use of UCY facilities, enriching the student experience, and facilitating living arrangements.

Both the student-admin and student-teaching staff ratios currently favour the student learning experience and quick access to academic and non-academic support. They should prepare for scaling these operations as future numbers increase.

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 connection with industry is enforced by the mandatory internship, however offering career counseling services and having accessible contact information of alumni that pursued a career in industry, would encourage the students to explore the many future options that are unlocked through this program.

Faculty and staff members are experienced researchers and knowledgeable individuals. However, with the exception of previous teaching experience in other institutions, there is no policy for training the new lecturers to improve their teaching skills. Opportunities for seminars could be offered to the teaching staff.

Wheelchair access is not facilitated in the building of the Graduate School, where the programme's teaching takes place. The first floor is entirely inaccessible to wheelchairs. The ground floor is partly accessible. Part of the ground



floor is elevated. This elevation is not high, it is however prohibitive to wheelchair access. The EEC recommends that this be remedied.

In the future, when the number of students increases, a formal T&L Committee to monitor the T&L processes, curriculum review and resources at all stages taking into account the student and staff feedback should be considered. It is recommended to have in place procedures, appropriate training, guidance and support, for teaching staff, to enable teaching staff to efficiently and appropriately support the educational process.

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

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>
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:*
 - o *regular meetings*
 - o *reports per semester and feedback from supervisors*
 - o *support for writing research papers*
 - o *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
6.1	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 Cyprus Institute houses the national High Performance Computing Centre in Cyprus. The CaSToRC staff have expertise in Computational Science, High Performance Computing and Machine Learning, all topics which are currently in vogue and in high demand.

CaSToRC has a thriving research and doctoral programme with all PhD students supported financially, and external collaboration with the University of Illinois at Urbana Champaign, USA.

It is therefore surprising and a matter of concern that the student numbers are low and are falling in the last two years in the current MSc programme.





The content of the programme should reflect a balance between Computational Science/High Performance Computing and Machine Learning.

Particular attention and resources should be directed at marketing the programme strategically to students in a catchment area within 3-4 hours flying distance of Cyprus.

The EEC recommends that the Institute management produce a strategic plan for expansion of the MSc programme over the next 5 years (in conjunction with their plans for increasing Faculty and doctoral student numbers over the same period) which is monitored at regular intervals to realise the enormous potential for the proposed MSc programme.



E. Signatures of the EEC

Name	Signature
D K Arvind	
Christina Lioma	
Giuseppe Di Fatta	
Marilena Lemonari	 MARILENA
Click to enter Name	
Click to enter Name	

Date: 2 February, 2024