Doc. 300.1.2

07.14.318.047

Higher Education Institution's Response

Conventional-face-to-face programme of study

Date: Date

- **Higher Education Institution:** Frederick University
- **Campus:** Nicosia and Limassol
- **School:** Engineering
- **Department / Sector:** Department of Electrical Engineering, Computer Engineering and Informatics
- **Programme(s) of study under evaluation Name (Duration, ECTS, Cycle)**

Programme

In Greek: Πληροφορική (4 ακαδημαϊκά έτη, 240 ECTS, Πτυχίο (BSc))

In English: Computer Science (4 academic years, 240 ECTS, Bachelor (BSc))

Language(s) of instruction: English

Programme's Status: Currently Operating

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. Guidelines on content and structure of the report

- *The Higher Education Institution (HEI) based on the External Evaluation Committee's (EEC's) evaluation report (Doc.300.3.1) must justify whether actions have been taken in improving the quality of the department in each assessment area.*

- *In particular, under each assessment area, the HEI must respond on, without changing the format of the report:*

    - *the findings, strengths, areas of improvement and recommendations of the EEC*
    - *the deficiencies noted under the quality indicators (criteria)*
    - *the conclusions and final remarks noted by the EEC*

- *The HEI's response must follow below the EEC's comments, which must be copied from the external evaluation report (Doc. 300.3.1).*

- *In case of annexes, those should be attached and sent on a separate document.*

1. Study programme and study programme's design and development

(ESG 1.1, 1.2, 1.7, 1.8, 1.9)

All areas marked as compliant

Areas of improvement and recommendations

1.a. *Currently there is not a specific review process of the program and a strategic plan of the department is not publicly available on the department's web site.*

A procedure is already in place for program review and development which is regulated by the relevant University Regulation. According to this regulation all university programs must undergo a revision every two years, following a predefined formal procedure. This procedure concerns the review of each course separately and the whole program curriculum. Furthermore, all courses are revised annually, with respect to minor changes in the course content, the bibliography and assessment methods and criteria. In this case, all changes are approved by the Department Council and the course website is updated accordingly. These changes are also reflected in the Course Outline given to the students at the beginning of the semester. At the Department level an Advisory Committee is in place consisting of stakeholders such as department graduates, employers, professional bodies and academics. This committee reviews and comments on the program revisions. Stakeholders such as students and graduates participate in the program review through their participation in focus groups within the Internal Quality System of the University.

The Strategic Plan of the Department of Electrical and Computer Engineering and Informatics (DECEI) is implemented via the short-, the medium- and the long-term Strategic Goals defined for a period of 5 years, towards the achievement of the mission and the vision of the Department. The Department's Mission, Vision and Strategic Plan are posted on the Departmental website.

1.b. *Some aspects of the program may require a revision. In particular, two aspects can be considered by the department according to a desired strategic plan: teaching and adoption of python should be moved to compulsory courses and an extended offer of more specific courses in the areas of data science and machine learning could be provided.*

Based on the recommendations of the EEC, the adoption of the Python programming language has already been implemented, and it is now part of the core/required courses. The Python programming language is delivered under the module ACSC430 – Dynamic Languages, which was previously offered an elective subject. The course introduces students to the Python programming language, as a language with a simple syntax, and a powerful set of libraries, a rich programming environment, and widely used in many scientific areas for data exploration. The aim of the course is to concentrate on the diverse areas of using the Python programming language, from simple applications, web and Internet development, scientific and numeric computing, to desktop GUI applications, embedded systems developments, and business applications.

In addition to the recommendations of the EEC, the program has been reviewed to offer more specific subjects in the areas of data science and machine learning. Two courses have been introduced as elective subjects ACSC438 – Computer Vision, and ACSC450 – Data Analytics and Visualisation.

Specifically, the module ACSC438 – Computer Vision considers the key concepts, algorithms of computer vision, computer vision applications and the technology associated with computer vision, and image processing. The course teaches the theory and application of techniques commonly used to analyse and interpret images. The course describes challenging real-world applications where vision is being successfully used, both for specialized applications such as medical imaging, and for fun, consumer-level tasks such as image editing and stitching, which machine learning and deep learning libraries can be used and applied, such as popular frameworks, platforms, and APIs like OpenCV, Keras, and TensorFlow.

The module ACSC450 – Data Analytics and Visualisation introduces students to the to the drivers of Data Analytics and the data value chain life-cycle, understand the opportunities and the impact of data analytics, the way that data analytics serves as a basis for data-driven decision making, and the trends in creating and/or identifying sources of data, preparing data for data analysis, processing data with data analytics tools to obtain insight, and communicating results with the aid of visualisation tools.

Please refer to **Annex 1** for the updated Course Descriptions.

2. Student – centred learning, teaching and assessment

(ESG 1.3)

Areas of improvement and recommendations

2.a.	*The university could consider the appointment of an external examiner for the degree programme, who ensures that examination and evaluation procedures are adhered to.*

The Department is employing the scheme of the Unit Coordinators, where the courses offered by its programs are grouped into Units according to their academic domain. Each Unit is assigned a Unit Coordinator who is the most senior faculty member in the domain. The Unit Coordinator has the overall responsibility for the courses in the Unit, including the moderation for course assessments. The Department intends to improve further this moderation mechanism by involving external examiners as well.

2.b.	*The courses should adopt a light-weight questionnaire mid-way to give lecturers immediate feedback, which can be addressed in the latter half of the course. This will complement the more weighty end-of-course questionnaire for course evaluation. Students will also see that their feedback is actively addressed during the course.*

In terms of adopting a light-weight questionnaire in the middle of semester in order to address issues in the latter part of the semester, as well as addressing students' concerns, the issue is addressed in a number of ways with certain procedures already in play, according to the University's regulations.

At the moment, the students during the 1st Consultation Week that takes place during the 5th week of the semester have the opportunity to meet with their Academic Advisors, discuss their progress and review their study path, discuss any problems or difficulties they may have that affect their academic performance, as well as formulating an Action Plan with their Academic Advisor in order to improve their academic performance. The Academic Advisors communicate this information on the Extranet Information System and the feedback obtained from students is immediately visible to members of staff that are responsible for the module taught during the semester. To address EEC's suggestion on the benefits of detecting potential issues at a very early stage, a questionnaire concerning each course a student is

attending, will be used during the first Consultation Week, where he/she will provide his/her concerns for each course to the Department. These questionnaires will be examined by the Department right after the first Consultation Week, where corrective measures will be decided.

In addition, each member of staff also has the opportunity to circulate anonymous feedback forms using other means (i.e. Google Forms, Moodle feedback forms, etc.) to obtain informal feedback from students during the semester, and take corrective actions.

2.c.	*Student feedback should be aggregated (without personal information) and communicated back to the students.*

According to the Internal Quality System of the University, student complete a questionnaire at the end of each semester for each course they have attended during the semester. This questionnaire comprises two parts. The first one concerns the instructor of the course and the second the course itself. The part concerning the instructor is used by the instructor for self-improvement, and by the Department during the annual Staff Appraisal. The second part is used by the Department in the annual Program Self-evaluation Report, as well during the program review process. Following EEC's recommendation on the need to provide feedback to the students on their opinions and suggestions, the Department will aggregate the suggestions provided anonymously by the students at the end of each semester and report on how students' concerns and suggestions are addressed by the Department. This report will be part of the annual Program Self-Evaluation report and also made available to the students.

2.d.	*The failure rate (ca. 16%) is much higher than the dropout rate (ca. 7%). The department should consider looking into the causes of this and defining a strategy for turning this around. Currently, these failure and dropout rates, combined with the relatively low number of students in the programme, compromise the sustainability of the programme.*

A study by Debut Careers among 140 UK universities showed that the average student drop-out rates in the UK is 6.3%, ranging from 1% to 18.6%. The drop-out rate for the BSc in Computer Science program is 7%, which is very close the UK average. However this figure should be ideally zero, since an increased drop-out rate could have a negative impact on the feasibility of the Department. For this reason the Department has adopted a number of

measures that aim to reduce the failure/drop-out rates. The Department employs qualified senior level students who act as tutors to weak students, therefore reducing student course failures. A second measure is the organization of two Consultation Weeks in the 5th and the 10th week of each semester, where all students must meet with their advisors to discuss issues concerning their performance, thus identifying possible performance issues and employ corrective measures at an early stage. The measures mention earlier, concerning students' feedback are also expected to have a positive impact on the reduction of the failure/drop-out rate.

3. Teaching staff

(ESG 1.5)

Findings

3.a. *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.*

Training courses, seminars and workshops were organized by the University for its faculty members in the past. Some of these actions were related to the re-engineering of the academic programs using student learning outcomes and student workload, teaching and assessment methods, as well as a series of seminars during the pandemic on online teaching, online assessment and open book examinations. The University acknowledges the need for a formal procedure on faculty training. To this end, the Center for Professional and Personal Development was established with the first training sessions planned for this September. Training related to didactics will be compulsory for all teaching personnel.

As mentioned earlier, the Department is employing the scheme of the Unit Coordinator, where the courses offered by its programs are grouped into Units according to their academic domain. Each Unit is assigned a Unit Coordinator who is the most senior faculty member in the domain. The Unit Coordinator has the overall responsibility for the courses in the Unit, including the moderation for course assessments. The Department intends to improve further this moderation mechanism by involving external examiners in a staff peer review scheme.

According to the University Regulations all new academic staff must be assigned a mentor. Furthermore, vising staff is also always assigned a mentor. The relevant regulation is in place for the last three years. During this period, there was only one case of a new academic staff, a person who has previously served as a visiting staff, with a mentor assigned. It is ensured that the Department will comply with this regulation whenever new academic staff is hired.

3.b.	*Finally, the EEC recommends that student aggregated feedback following the course evaluation survey to be used in the program review procedures.*

According to the Internal Quality System of the University, student complete a questionnaire at the end of each semester for each course they have attended during the semester. This questionnaire comprises two parts. The first one concerns the instructor of the course and the second the course itself. The part concerning the instructor is used by the instructor for self-improvement, and by the Department during the annual Staff Appraisal. The second part is used by the Department in the annual Program Self-evaluation Report, as well during the program review process. Furthermore, students and graduates participate in the program review through their participation in focus groups within the Internal Quality System. To address the above EEC's suggestion the Department will work on improving the procedures employed and the contribution of the students in the program review.

4. Student admission, progression, recognition and certification

(ESG 1.4)

All areas marked as Compliant

4.a.	*A formal feedback on assessed coursework and assignments should be consistently provided in all modules.*

According to the University Regulations all assessed coursework, lab reports and assignments must be corrected and returned to the students properly annotated with comments within two weeks from the submission date. The rubrics used for marking students work must also be provided to the students in advance. Compliance to this regulation by the faculty is checked with two questions in the students' questionnaires completed by all students at the end each semester. The first question concerns the compliance with respect to the date when the corrected work was returned to the students and the second concerns the compliance with respect to the feedback provided to the students. Students requiring more clarifications on their solutions can discuss them during the office hours of the course instructor. Aggregated feedback from the students, through these questionnaires, shows that the majority of the teaching staff complies with this regulation. The Department will work on establishing procedures that will ensure that all teaching staff comply with this regulation for all courses they teach.

Furthermore, students have the right to review their corrected answer books of their final exam documents, within five working days from the day that the exam results are published.

4.b.	*The EEC recommends the development of an action plan to help increasing the number of applicants and of enrolled students over the next years. Some initiatives could be devised to help attracting more female applicants. Some specialisation fields of computer science could be more attractive for female applicants. The department may look into which specific areas of specialisation could be highlighted for this purpose.*

The Department in collaboration with the University's Communications and Outreach Service is working towards the development of a strategy and an action plan to help increasing the number of applicants and of enrolled students over the next years. There is a global shortage on ICT/CS/CoE graduates as the field is in increase demand further to the current situation. In addition, the University has formulated a School-wide strategy on attracting more female applicants, with a 50% fees reduction to all female students enrolled in any of the programs of the School of Engineering.

Moreover, as part of our strategy to offer an outstanding student learning experience by providing our students with the best possible curricular and co-curricular personal development opportunities, and in terms of allowing students to select Computer Science Electives from a list of subjects that are offered in collaboration with other Departments. In this case, some Computer Elective courses offered in Computer Science, might be more attractive for female students. In addition, the Department has already examined the possibility of offering specialisation areas that again may be more appealing with female applicants, and is currently formulating a framework for addressing these possibilities.

5. Learning resources and student support

(ESG 1.6)

All areas marked as Compliant

Findings

5.a.	*The rate of female students is very low. There is no strategy for attracting more female students to the programme. The department should define and implement such a strategy.*

An integral part of Frederick University's identity and operation is its strategy for sustainable development. The United Nations Sustainable Development Goals are the path that will lead to a healthy planet, peaceful world that everyone enjoys a health, security and prosperity. This cannot be achieved without the emancipation of women. As part of the University's policy is to promote gender equality over time and to empower all women and girls so that they can meet the current challenges and become the change our world needs.

The University has launched a long-term campaign with the aid of successful women in the fields of Engineering, as a source of inspiration for young girls, as well as promoting the prospects of pursuing a career in Engineering and Technology. In addition, as part of the campaign, the University is currently offering scholarships to female applicants wishing to study in undergraduate programs under the School of Engineering. The campaign can be found via the social media of the University (Scholarships for Women in STEM (Link), Women and Girls in Science (Link)) and the policies regarding equality, diversity and inclusion matters are published in the University's website; (a) University Policies (Link) (b) The role of Frederick University in gender equality issues (Link), (c) Participation in ACT-on-Gender European Project for gender Equality (Link)

6. Conclusions and final remarks

The EEC reviewed and examined the materials provided by the Frederick University pertaining to its four---year Computer Science program which runs at both the Nicosia and Limassol campus sites. The one---day site visit was held on 14.5.2021.

The EEC was presented with detailed information about the four---year 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**.

The EEC identified the following key strengths:

- In the program structure there is evidence of a particular specialisation in programming languages aimed at developing essential programming skills important for enhancing the graduate employability.
- Courses and services are offered to both campuses, so that students do not have to travel to another campus.
- Excellent student---staff ratio, and the students have commented that the instructors are accessible and helpful.
- Students are offered a preparation course by the university, the summer immediately before the BSc program starts.

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

- The program review process lacks vision and a strategic direction towards current thematic areas, for example Data Science and AI.
- Student feedback should be aggregated (without personal information) and communicated back to the students. These aggregated results should also be used for the program's annual review process.
- The failure rate is much higher than the dropout rate and the team requires defining a strategy for addressing these issues.

- The development of a systematic central support menu with regards to staff induction, mentoring and further development including the implementation of teaching staff peer observation procedure.
- The development of an action plan to help increasing the number of applicants and of enrolled students over the next few years.
- The development of an action plan could be devised to help increase the numbers of female students and staff.

The Department of Electrical Engineering, Computer Engineering and Informatics wishes to express its gratitude to the members of the External Evaluation Committee for their thorough and insightful evaluation of the undergraduate programme of study BSc in Computer Science, as well as their fruitful comments and constructive discussion. The accreditation process provided the opportunity to the Department and the Program Coordinators to obtain the objective views of external and independent peers, as well as examine aspects of the program from a different perspective. The Department has already considered the issues raised, as well as the recommendations of the EEC and has already acted upon, in terms of implementing the Committee's recommendations as shown in sections 1 to 5.

The Department also wishes to thank the Cyprus Agency of Quality Assurance and Accreditation in Higher Education, as well as the members of staff of the Agency that facilitated the organisation and implementation of the External Evaluation Committee's visit and the accreditation of the BSc Computer Science program of study.

7. **Higher Education Institution academic representatives**

Name	*Position*	*Signature*
Prof. George Demosthenous	Rector