



07.14.318.056

Doc. 300.1.2

## Higher Education Institution's Response

### Conventional-face-to-face programme of study

Date: Date

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

#### Programme

##### **In Greek:**

Μηχανική Μηχανολόγων Μηχανικών, (4 ακαδημαϊκά έτη, 240 ECTS, Πτυχίο (BSc))

##### **In English:**

Mechanical Engineering (4 academic years, 240 ECTS, Bachelor (BSc))

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

- **Specializations (if any):**

##### **In Greek:**

1. Γενική Κατεύθυνση
2. Μηχανική Υδρογονανθράκων

##### **In English:**

1. General
2. Oil & Gas Engineering



### 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

All areas marked as compliant

### Areas of improvement and recommendations

A relatively low total number of students is obviously a strength for studying students who benefit from the low student-per-teacher ratio. However, this might also be a financial stretch for DME considering the small size and limited resources of the department and the university as a whole. Therefore, it might be useful to:

- a. *Enhance the activities of program management in recruiting more students from local communities as well as making the program more attractive for international students. These can be achieved through:
  - i) *the introduction of 'specialty' courses addressing the needs and therefore sponsored by local industrial companies;*
  - ii) *the creation of summer schools, vocational study courses and academic exchanges through Erasmus+ and other programs in the EU and beyond;*
  - iii) *capitalising on regional advantages including geographical attractiveness**

### Department's Response:

- i. An existing course of the programme that address this issue is the HVAC, a very modern and state of the art laboratory was sponsored 100% by a local company. In the context of HVAC course, we have introduced the preliminary design activity.
- ii. In an effort to attract more students, and enhance the participation of female students in the engineering field, the University has launched a campaign called "Women in STEM" ([Link](#)) offering scholarships to all women interested in any of the programmes in the field of engineering and technology, as means to both implement the University's EDI (Equality, Diversity, Inclusion) [policy](#) goals as well as to further promote the engineering programmes.

The Department already actively encourages the international cooperation and exchange agreements of both students and academic staff. Indicatively, the Department of Mechanical Engineering, during the past five (5) years, sixteen (16)

students have participated in mobility exchange programs, while the department has hosted nineteen (19) students and three (3) academics from Universities abroad. The COVID-19 pandemic did not enable more exchanges during the past two (2) years but more exchanges this semester are underway of both students and academics. Furthermore, the department has signed agreements for collaboration with more than twenty (20) international Universities and the list is continuously growing. Table 1 below shows the agreements signed so far.

*Table 1. Agreements with Institutions*

Num.	University	Country
1.	Tallinn University of Technology	ESTONIA
2.	Helsinki Metropolia University of Applied Sciences	FINLAND
3.	Seinajoki University of Applied Sciences	FINLAND
4.	Universite d' Orleans	FRANCE
5.	University of Stuttgart	GERMANY
6.	Aristotelio University, Thessaloniki	GREECE
7.	ASPETE	GREECE
8.	Technological Education Institute of Crete	GREECE
9.	University of Patras	GREECE
10.	TEI of Crete	GREECE
11.	ATEI of Thessaloniki	GREECE
12.	Hogeschool van Amsterdam	NETHERLANDS
13.	Instituto Politechnico de Lisboa	PORTUGAL
14.	Coventry University	UK
15.	University of Bucharest	ROMANIA
16.	Technical University of Cluj-Napoca	ROMANIA
17.	The Queen's University of Belfast	UK
18.	Wroclaw University of Technology	POLAND
19.	University of Brighton	UK
20.	University of Pireas	GREECE
21.	Kaunas University of Technology	LITHUANIA

The University is also a member of the EU-Connexus network, and through that participation the department will be able to exchange student through summer schools, with the other partner Universities.

- iii. Indeed, the geographical location of Cyprus gives an added value to the department effort towards recruiting more students, the University acknowledge this and includes it, in its strategy to attract more international students.

b. *Increase the use of interactive tools including virtual and remote-control laboratories.*

**Department's Response:**

The Department of Mechanical Engineering is heavily investing in shifting towards software labs and this is also essential for our research activities. Our students, besides physical labs, participate in labs where simulation packages are used (e.g. AutoCAD, Solid Works, Matlab, Automotive ESI tronic software, GaBi (Life Cycle Assessment software)).

Activities using software and simulators are well incorporated in our individual courses and key knowledge is expected in the learning outcomes.

c. *Reduce the teaching load of academic personnel to allow them more time for attracting extramural funding for fundamental research and applied projects with local industries.*

**Department's Response:**

At University level, the working time of faculty members is equally split between teaching and research, with the exception of faculty members with administrative duties. The above is also true for the faculty of the Department. The University has already in place a teaching load reduction scheme for faculty with a significant research load, such as the coordination of externally funded research projects. With this scheme, faculty members can have a three (3) period per week teaching load reduction. Furthermore, faculty members can have extra teaching load reduction by covering (paying for) the extra costs to the University due to this teaching load reduction, using the research funds they maintain in their personal Research Account.

- d. *The undoubtedly strong side of the BSc program in having the “placement internship” can be further facilitated by the FU administration through the formalisation of relationships with industrial companies where students typically go. This may also lead to longer-term joint programs with respective companies in research and development.*

**Department’s Response:**

The Careers office of the University provides career guidance with its Liaison Office. This office operates under the Research and Interconnection Service of the University. The purpose of this office is to provide services to the students related to work placement courses, internships and employment, as well to the departments and the academic/research personnel concerning their cooperation with the industry and the business world.

Internship is already applied to all undergraduate programmes of the University, It’s in the strategic goals of the University and the Department to expand the internship to postgraduate studies as well.

Following the EEC’s recommendation, the Department will work further on the formalization of its relationships with the industrial sector and exploit further the benefits from such cooperations.

- e. *The alumni relationships program should also be considerably enhanced. This will demonstrate opportunities for attracting new students and establishing strong ties with companies employing the program graduates.*

**Department’s Response:**

The creation of the alumni community is an effort of the past two years, as per the Rector’s initiative for the creation of Alumni Associations in every Department. Due to Covid-19, the effort was held back but the Departments are continuing the development starting next academic year.

Records are hold for all of alumni in the department’s programmes, and an alumni meeting is be planned as early as next academic semester.

## 2. Student – centred learning, teaching and assessment

### (ESG 1.3)

**All areas marked as compliant**

#### Areas of improvement and recommendations

- a. *Although some students might become exposed to a research project, the opportunities for that are limited. It will be beneficial for the students and the BSc program to have at least one elective 'research project' course within which students will have an opportunity to carry out a theoretical or experimental project and to present / defend its outcomes in front of their peers and teachers.*

#### Department's Response:

The research project is mandatory in the programme structure as we believe all students should be exposed to research components through out their studies.

The research project is broken down to two courses:

- a. ME399 / OG399 – Research Techniques for thesis preparation (7th Semester), where the students learn techniques such as referencing, writing style, literature reviewing, content structure, figures and tables and numbering systems, learn how to structure a report, are given the guidelines for plagiarism, learn how to contact literature review and surveys on their topics of choice.
- b. ME400 / OG405 – Senior Project, where the students under the supervision of their project advisor (1) clearly state an existing engineering problem (2) perform extensive literature review in order to find what has been done on the subject by other scientists (3) identify the project which will provide a solution to the existing engineering problem by introducing an innovation, (4) Divide the project in several distinct Work Packages which contain different Tasks in a timetable, towards the successful completion of the project, (5) Execute the theoretical and experimental work according to the timetable and Write the Mid-Term Overview report and (6) Write the final report presenting all the theoretical and experimental work, including the methodology used, the results, the final conclusions and future suggestions.



At the end of the course, students are responsible for presenting a final report that will include a detailed mathematical background of the problem, justify design decisions taken, include working drawings, specifications, calculations and cost assessment where applicable and orally present their work and answer questions in front of a committee consisted by their instructors and their peers.

### 3. Teaching staff

#### (ESG 1.5)

**All areas marked as compliant**

#### Areas of improvement and recommendations

- a. *Very limited number of teachers on the BSc program seems to be actively involved in international collaborations and academic exchanges. Although BSc programme is primarily oriented towards the needs of local communities, it will certainly benefit from adopting best practices from other leading universities 20 in the EU and beyond. Therefore, the enhancement of academic exchanges is strongly recommended. The program will also benefit from recruiting early-career researchers with the experience of work in leading universities in the EU.*

#### Department's Response:

The Department already actively encourages the international cooperation and exchange agreements of both students and academic staff. Indicatively, the Department of Mechanical Engineering, during the past five (5) years, sixteen (16) students have participated in mobility exchange programs, while the department has hosted nineteen (19) students and three (3) academics from Universities abroad. The COVID-19 pandemic did not enable more exchanges during the past two (2) years but more exchanges this semester are underway of both students and academics. Our department is strongly focused towards internationalisation since any future development is closely linked with synergies with other academic/ research institutions. This is realised either with common research activities, or staff/ student exchanges or with initiatives in developing common programmes of study.

Last but not least, our Department already forms a strategy in order to further internationalise its profile (both academics and students) through the increase of mobility via the Erasmus program, further involvement in EU-Conexus networks (Frederick University is an associate member of EU-Conexus European University for Smart Urban Coastal and Sustainability;[Link](#)). Through the EU Conexus network participation the department will be able to participate in joint programmes with the other member Universities. Additionally, the



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Department is already in contact with a number of Universities to investigate the possibility to for joint programmes of study.



#### 4. Student admission, progression, recognition and certification

(ESG 1.4)

**All areas marked as compliant**

##### Areas of improvement and recommendations

a. *The established routines seem to be functioning adequately.*

##### Department's Response:

We would like to thank the EEC for their positive remarks.

## 5. Learning resources and student support

(ESG 1.6)

**All areas marked as compliant**

### Areas of improvement and recommendations

- a. *The available human resources, although very useful for the student comfort, make DME very vulnerable to changing economic situation. Therefore, development of tools for digital education and the enhancement of research program at the expense of reducing teaching load on academic personnel is recommended.*

### Department's Response:

The University offers a significant number of Distance Learning (DL) programs, and the aim is that in the next few years every department should offer at least one DL program. Due to this, the University has in place an e-learning platform that offers a variety of digital education tools. These tools are also available for the conventional (face-to-face) programs. Since 2018, all courses for all conventional programs are delivered through the e-learning platform. Digital education tools were fully exploited during the recent pandemic, where most of the time classes were delivered online. These tools include annotated/narrated presentations, short lecture videos, self-assessment online quizzes, online simulators, virtual labs etc. To this end, a series of training courses were developed, where all academic personnel was trained on the development and use of such tools. The University, recognizing the importance of the use of digital education tools has decided to incorporate them in its teaching policy for conventional programs, since they improve significantly the quality of the provided education.

Exploiting the advantages offered by some of the digital education tools could in some cases, reduce the class contact hours. As an example of this, is the use by students of simulators or virtual labs in laboratory classes, during the pre-lab preparation that could result in a reduced presence time in the labs for the actual experiments. Another example is the development of short problem solving videos or the use of existing online simulators, combined with online self-assessment quizzes, which can be used by students to prepare for tutorial sessions, while the instructor will be aware of students' weaknesses and organize better the tutorial session, resulting in less time allocated for the tutorial session, and in better educational results achieved.

Student contact hours and human resources available to students are essential for a student-centric university and have a significant impact on the quality of learning. Class contact hours for all courses are within the norm, and are specified in the approved curriculum. A possible reduction in class contact hours can be examined during a program revision, while such changes need to be formally approved.

The University recognizes the relationship between the teaching load for academic personnel with the feasibility of its departments, as well as, the time available to conduct research. Reducing academic personnel teaching load by reducing class contact hours is not an option. There are other options that the University can further exploit in order to reduce the teaching load of academic personnel, such as the more optimized planning of the courses to be offered in each semester by reducing the number of courses offered in both the Fall and the Spring semesters, or by merging cohorts of courses with the same content. Furthermore, as mentioned in section 1c above, the University has in place a variety of schemes linked to research output that result in the reduction of teaching load for academic personnel. It is noted that the extra expenses incurred by this scheme are covered by the University's income from externally funded research programs.

## 6. Conclusions and final remarks

The members of the EEC committee found the BSc programme in Mechanical Engineering, the MSc programme in Energy Engineering and the PhD programme in Mechanical Engineering to be compliant in all examined aspects. Overall, the programmes have been successful in attracting and motivating students. The existing course offerings provide a balance between fundamentals and practice including several activities that demonstrate effective practices of active learning, which is an important element of contemporary education. Moreover, the existing teaching laboratories and department facilities are of high quality in general.

A thorough revision of a broad range of examples on MSc/PhD dissertations demonstrates the complementary activities of academic staff in various emerging areas in Mechanical Engineering. This is particularly interesting because former graduates have been absorbed in high-profile industries or they hold academic positions in various institutions.

With regard to teaching, formal procedures have been established so as student feedback is seen in a constructive manner for the further tailoring of existing coursework, which follows the state-of-the-art. The ratio of a number of students-per-lecturer appears to be rather low, which can be considered an advantage. With regard to admission requirements, formal control points have been established so as high-calibre students enter the university at all levels. Moreover, doctoral student supervising/mentoring follows the same standards and practices of well recognised academic institutions. PhD candidates have adequate opportunities to present and disseminate their research findings at high-profile scientific meetings and national/international conferences. Most faculty and graduate students publish their scientific results in international high-impact peer-reviewed journals in the field of discipline based on numerous examples presented to the EEC committee.

Some recommendations for further improvements would include the following:

- Potential use of more digital resources in education (e.g., Massive Open Online Courses) as well as considerations in the graduate and post-graduate programmes.

- Consideration of emerging technological trends, such as the ones related to the 4th Industrial Revolution in the educational programmes.

The **evaluated graduate programmes are found useful** for addressing the needs of local industrial sectors and related business activities.

**Project-based learning is a real asset** because it allows students to experience real-world collaboration and to apply the learning from courses immediately in an applied project.

The **teaching staff is well qualified** to achieve the objectives and planned learning outcomes and to ensure quality and sustainability of the teaching and learning in the study programme.

The management of the University should take permanent care of keeping a **well-balanced and appropriate number of staff** in the programme.

The **students are in general very satisfied** with their accomplishments in the programme.

Generally, there is an **excellent availability of accessible resources** for achieving the objectives of the evaluated programmes

#### **Department's Response:**

Concluding we would like to thank the EEC for their hard work and candid discussions held throughout the rigorous process of the evaluation. The University and the Department has adopted all suggestions made the EEC as shown in the answer in sections 1-5. We are particularly pleased and gain much needed strength from the overall positive remarks and will strive to further improve and achieve our strategic goals in the near future



## B. Higher Education Institution academic representatives

<i>Name</i>	<i>Position</i>	<i>Signature</i>
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Date: [Click to enter date](#)

