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Date: Date.

# External Evaluation Report

(Programmatic within the framework of Departmental Evaluation)

- **Higher Education Institution:**  
Frederick University
- **Town:** Nicosia
- **School/Faculty:** Engineering/Mechanical Engineering
- **Department:** Mechanical Engineering
- **Programme(s) of study - Name (Duration, ECTS, Cycle)**  
**Programme 1 – BSc in Mechanical Engineering**  
**In Greek:**  
Programme Name  
**In English:**  
Mechanical Engineering (4 academic years, 240 ECTS, Bachelor (BSc))  
**Language(s) of instruction: English**
- **Programme 2 – MSc in Energy Engineering**  
**In Greek:**  
Programme Name  
**In English:**  
Energy Engineering (3 academic semesters, 90 ECTS, Master (MSc))  
**Language(s) of instruction: English**
- **Programme 3 – PhD in Mechanical Engineering**  
**In Greek:**  
Programme Name  
**In English:**  
Mechanical Engineering (3 academic years, 180 ECTS, Doctorate (PhD))  
**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].



## A. Introduction

*This part includes basic information regarding the onsite visit.*

Although planned well in advance, an onsite visit was postponed several times due to COVID-19 associated pandemic and eventually abandoned in favour of a series of online sessions including virtual tour around premises to be evaluated. All the online sessions took place during December 21<sup>st</sup> and 22<sup>nd</sup>, 2021. They consisted of a sequence of online meetings of the committee members with Frederick University (FU) and the School of Engineering management and administration followed by meetings with academic and technical personnel at the Department of Mechanical Engineering (DME) as well as students and recent alumni from BSc, MSc and PhD graduate programs under evaluation. The committee members were also provided with all relevant documentation and video materials in the amount sufficient for an adequate evaluation of DME along with the graduate programs.



## B. External Evaluation Committee (EEC)

<i>Name</i>	<i>Position</i>	<i>University</i>
<b>Nicolas Moussiopoulos, Chair</b>	Professor	Aristotle University Thessaloniki
<b>Dimitrios Kyritsis</b>	Professor	EPFL
<b>Dmytro Orlov</b>	Professor	Lund University, Sweden
<b>Iakovos Christodoulou</b>	Professional Mechanical Engineer	Scientific and Technical Chamber of Cyprus (ETEK) representative
<b>Panagiotis Chrysanthou</b>	Student Member	University of Cyprus

## C. Guidelines on content and structure of the report

- *The external evaluation report follows the structure of assessment areas.*
- *At the beginning of each assessment area there is a box presenting:*
  - sub-areas*
  - standards which are relevant to the European Standards and Guidelines (ESG)*
  - 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 each programme of study as a whole.*
- **The report may also address other issues which the EEC finds relevant.**

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

### Sub-areas

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

### 1.1 Policy for quality assurance

#### Standards

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

### 1.2 Design, approval, on-going monitoring and review

#### Standards

- *The programme of study:*
  - *is designed with overall programme objectives that are in line with the institutional strategy and have explicit intended learning outcomes*
  - *is designed by involving students and other stakeholders*
  - *benefits from external expertise*
  - *reflects the four purposes of higher education of the Council of Europe (preparation for sustainable employment, personal development, preparation for life as active citizens in democratic societies, the development and maintenance, through teaching, learning and research, of a broad, advanced knowledge base)*
  - *is designed so that it enables smooth student progression*
  - *is designed so that the exams' and assignments' content corresponds to the level of the programme and the number of ECTS*
  - *defines the expected student workload in ECTS*
  - *includes well-structured placement opportunities where appropriate*
  - *is subject to a formal institutional approval process*

- *results in a qualification that is clearly specified and communicated, and refers to the correct level of the National Qualifications Framework for Higher Education and, consequently, to the Framework for Qualifications of the European Higher Education Area*
- *is regularly monitored in the light of the latest research in the given discipline, thus ensuring that the programme is up-to-date*
- *is periodically reviewed so that it takes into account the changing needs of society, the students' workload, progression and completion, the effectiveness of procedures for assessment of students, student expectations, needs and satisfaction in relation to the programme*
- *is reviewed and revised regularly involving students and other stakeholders*

### 1.3 Public information

#### Standards

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

### 1.4 Information management

#### Standards

- *Information for the effective management of the programme of study is collected, monitored and analysed:*
  - *key performance indicators*
  - *profile of the student population*
  - *student progression, success and drop-out rates*
  - *students' satisfaction with their programmes*
  - *learning resources and student support available*
  - *career paths of graduates*
- *Students and staff are involved in providing and analysing information and planning follow-up activities.*

You may also consider the following questions:

- *What is the procedure for quality assurance of the programme and who is involved?*
- *Who is involved in the study programme's design and development (launching, changing, internal evaluation) and what is taken into account (strategies, the needs of society, etc.)?*
- *How/to what extent are students themselves involved in the development of the content of their studies?*
- *Please evaluate a) whether the study programme remains current and consistent with developments in society (labour market, digital technologies, etc.), and b) whether the content and objectives of the study programme are in accordance with each other?*
- *Do the content and the delivery of the programme correspond to the European Qualifications Framework (EQF)?*
- *How is coherence of the study programme ensured, i.e., logical sequence and coherence of courses? How are substantial overlaps between courses avoided? How is it ensured that the teaching staff is aware of the content and outputs of their colleagues' work within the same study programme?*
- *How does the study programme support development of the learners' general competencies (including digital literacy, foreign language skills, entrepreneurship, communication and teamwork skills)?*
- *What are the scope and objectives of the foundation courses in the study programme (where appropriate)? What are the pass rates?*
- *How long does it take a student on average to graduate? Is the graduation rate for the study programme analogous to other European programmes with similar content? What is the pass rate per course/semester?*
- ***How is it ensured that the actual student workload is in accordance with the workload expressed by ECTS?***
- *What are the opportunities for international students to participate in the study programme (courses/modules taught in a foreign language)?*
- *Is information related to the programme of study publicly available?*
- *How is the HEI evaluating the success of its graduates in the labor market? What is the feedback from graduates of the study programme on their employment and/or continuation of studies?*
- *Have the results of student feedback been analysed and taken into account, and how (e.g., when planning in-service training for the teaching staff)?*
- *What are the reasons for dropping out (voluntary withdrawal)? What has been done to reduce the number of such students?*



## **Findings**

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

### **Findings for BSc in Mechanical Engineering**

The BSc program in Frederick University fulfils all the formal requirements set by respective regulators in Cyprus and therefore has a formally approved and publicly available official status. It also fulfils all the standards for quality, non-discrimination, and academic integrity, has necessary monitoring systems and administrative support. The program has clearly defined objectives, structure and outcome goals including ECTS-based system for student knowledge assessment well aligned with the purposes of higher education of EU council including EQF. This program seems to be regularly reviewed and updated based on feedback from academic personnel, students and evolving societal needs. A signature of the later is the introduction of “Oil and Gas Engineering” specialisation to address emerging needs of industrial energy sector of Cyprus. The distribution of load and ECTS assignments over the study years is clear and appropriate.

With the most of the academic courses compulsory in the BSc program, it has clearly defined structure gradually building students background in relevant disciplines. Nevertheless, the program has a strong focus on the applied knowledge and practical skills of students.

### **Findings for MSc in Energy Engineering**

The fundamental topics are well distributed during the semesters.

The content of the program corresponds to the EQF. The content program looks coherent.

The foundation courses are designed to ensure a solid theoretical basis of students so as they can eventually apply the theoretical basis of what they were taught into practice and/or in research works.

Passing/failing rates are rather reasonable.

Program objectives are clear and are aimed to fulfil an important need in the market for professionals with a broad multi-disciplinary background and with experience in collaborative work.

The program supports the personal and professional development of the students by introducing them to new areas of knowledge, and developing new skills.

Learning outcomes are rather clearly defined.

The plan of studies is simple and clear so students should find it easy to progress through the program.

The expected workloads are clearly defined.

The content of all the compulsory courses, and some of the elective courses, is influenced by the need to serve students from a wide range of backgrounds.

The programme web site contains information on the programme structure and requirements, admission criteria, learning and assessment procedures, and qualification awarded.

### **Findings for PhD in Mechanical Engineering**

Usually, a full time PhD student graduates in 4 years.

The PhD programme is organized in usual PhD research activities that correspond to ECTS in order to facilitate the organization and the monitoring of the work of a PhD candidate.

There is a form of candidacy examination after one year of the doctoral studies.

### **Strengths**

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

#### **Strengths for BSc in Mechanical Engineering**

The BSc program can be considered a particular strength of the university stemming from its former experiences as a college. It has a clear connection to the societal and industrial needs of the local community. Placement internship is a highlight of the programme working as a launchpad for the professional career of the program graduates.

#### **Strengths for MSc in Energy Engineering**

The MSc programme in Energy Engineering is an outstanding professional degree that seems to be very beneficial to the professional development of the students and their employability prospects.

#### **Strengths for PhD in Mechanical Engineering**

The foundational quality of PhD programme in Mechanical Engineering is the recognized quality of the faculty involved in it and their will to initiate and conduct international level original research.

### **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.*

#### **Areas of improvement and recommendations for BSc in Mechanical Engineering**

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:

- 1) 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:
  - a) the introduction of 'specialty' courses addressing the needs and therefore sponsored by local industrial companies;
  - b) the creation of summer schools, vocational study courses and academic exchanges through Erasmus+ and other programs in the EU and beyond;
  - c) capitalising on regional advantages including geographical attractiveness.

- 2) Increase the use of interactive tools including virtual and remote-control laboratories.
- 3) 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.

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.

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.

#### Areas of improvement and recommendations for MSc in Energy Engineering

An annual review and development procedures at the MSc programme level would be useful. The review should consider aspects such as technology changes (for example the current trends of the 4<sup>th</sup> Industrial Revolution), students’ feedback, and the changing market requirements for graduates. The review should consider aspects such as: programme specification, forward planning budget, and resource provision.

Inputs should be solicited from external stakeholders and the alumni of the programme, for example by performing a market study including: demand for graduates, skill set requested by potential employers, competing programs, both national (Cyprus + Greece) and international.

It would be useful to initiate specific work placement events to introduce students to potential employers, in collaboration with relevant industry (in Cyprus and abroad), and government agencies.

A well prepared internship program with relevant industry (in Cyprus and abroad), interested employers and government agencies would be very beneficial for both students and faculty as it would have the potential to lead to industry-oriented Master projects for students and research and/or consulting projects for faculty.

#### Areas of improvement and recommendations for PhD in Mechanical Engineering

The PhD programme in Mechanical Engineering has the potential to attract international students.

Actions towards a more international visibility of the PhD programme would help to extend its attractiveness to selected countries.

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

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>		
		<i>BSc in Mechanical Engineering</i>	<i>MSc in Energy Engineering</i>	<i>PhD in Mechanical Engineering</i>
1.1	Policy for quality assurance	Compliant	Compliant	Compliant
1.2	Design, approval, on-going monitoring and review	Compliant	Compliant	Compliant
1.3	Public information	Compliant	Compliant	Compliant
1.4	Information management	Compliant	Compliant	Compliant

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

### Sub-areas

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

**2.2 Practical training**

**2.3 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 and 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.*

### **Findings for BSc in Mechanical Engineering**

By virtue of being a small university with a limited number of students, the BSc programme is found to be truly centred on the needs of students and local communities. It is of high educational standard with a good balance between theoretical background and practical skills. The formal assessment of student knowledge appears to be adequate and fulfilling the EQF. Even if some procedures are not formalised, the experience of teachers and DME makes very comfortable climate for studies. This is reflected in both formal feedback from students at the end of every course and personal communication of the committee members with students. Students often refer to the climate in the department and accessibility of teachers as major factors in their decision-making process for entering FU and staying in the BSc study programme until graduation.

### **Findings for MSc in Energy Engineering**

The virtual visit and the application files have demonstrated that the programme follows a student-centred teaching policy, and this is reflected by the various modes of conduct for the transfer of information and knowledge to the student.

The programme supports the students' individual development through the course activities and associated assignments, while projects and group assignments prepare the students for working in a collaborative social setting.

The assessment of the performance of the students in their courses is based on a combination of activity during lectures / assignments, and exams (mid-term and final).

Methods of assessment are known.

### **Findings for PhD in Mechanical Engineering**

The virtual visit and the interviews have demonstrated that the programme follows a student-centred PhD work policy, and this is reflected by the various modes of conduct for the transfer of information and knowledge to the student.

## **Strengths**

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

### **Strengths for BSc in Mechanical Engineering**

Good balance between theoretical and practical courses and the accessibility of teaching personnel can be considered main strengths of the BSc program.

The students also benefit from excellent experimental facilities.

Placement internship is a particular highlight of the programme accomplishing student education.

### **Strengths for MSc in Energy Engineering**

The variety of examples provided regarding the Master Theses of the students and the variety of their current employment status indicates a student and specific skill centred policy which has excellent results.

- Overall a good combination of theoretical and practical studies within the programme.
- Good support for individual and social development of students. The number of students per teacher is adequate (~ 20 students per class).

Projects are an asset of this programme, as they allow application of knowledge from the courses in a real-life setting, and in the same time preparing the candidates for working in multidisciplinary teams.

### **Strengths for PhD in Mechanical Engineering**

Consistent assessment procedures are established; this is demonstrated by the fact that doctoral students are efficient in completing their work in 4 years when they work full time.

A formal evaluation procedure of doctoral students in line with international standards is put in place for transparent evaluation.

### **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.*

#### **Areas of improvement and recommendations for BSc in Mechanical Engineering**

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.

#### **Areas of improvement and recommendations for MSc in Energy Engineering**

We recommend inclusion of regular assessment of the so called "soft skills" of the students throughout the programme, e.g. within courses, in the form of the exams, with the aid of modern educational technologies etc.

#### **Areas of improvement and recommendations for PhD in Mechanical Engineering**

For the better visibility of the PhD programme, participation with paper presentations in well recognized international conferences would help to make known of the good research achievements of the PhD candidates and the involved faculty and expand the academic network of the whole University.



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

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>		
		<i>BSc in Mechanical Engineering</i>	<i>MSc in Energy Engineering</i>	<i>PhD in Mechanical Engineering</i>
<b>2.1</b>	Process of teaching and learning and student-centred teaching methodology	Compliant	Compliant	Compliant
<b>2.2</b>	Practical training	Compliant	Compliant	Compliant
<b>2.3</b>	Student assessment	Compliant	Compliant	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.*

#### **Findings for BSc in Mechanical Engineering**

The qualifications of teaching personnel participating in the BSc program is more than adequate and sufficient for quality education. Most of them have formal degrees and qualifications obtained abroad, which ensures familiarity with good international practices. Some of teaching personnel has only part-time affiliation with the DME with main affiliation being in industry, which provides good opportunities for integrating real-life challenges into the teaching practices.

#### **Findings for MSc in Energy Engineering**

The teaching staff is formed by professors, associate professors and assistant professors.

All courses in the programme are supported by teaching staff specialised in the field of specific course.

The recruitment and development of the teaching staff is secured by the department based on university rules.

Based on a set of CV's enclosed in an application and supported by discussion with representatives of the teaching staff during on-site meeting, the committee is convinced that teaching staff qualifications are adequate to achieve the objectives and planned learning outcomes and to ensure quality and sustainability of the teaching and learning in the programme.

Most of the teaching staff involved in the study programme is highly motivated and enthusiastic and are collaborating in the specific scientific field with other partners on country as well as international level.

This has been recognised by a number of research projects performed in the specific field which the staff are involved with.

#### Findings for PhD in Mechanical Engineering

The involved staff are recognized scientists with very relevant background and research to programm.

Several members have efficiently integrated research related courses, but of high value to industry and good theoretical value to the programme.

#### Strengths

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

#### Strengths for BSc in Mechanical Engineering

All the personnel involved in the teaching process appears to be very passionate about teaching and carrying about the students. The teachers are found to be very experienced while also open for introducing new methods into the educational courses.

#### Strengths for MSc in Energy Engineering

Very good ratio of number of students to lecturers

Good age proportion of the teaching staff: there are involved young teachers assuring continuation of the programme in long term perspective

Involvement of teaching staff in the research enable continuous update of the programme by innovative solutions

Good number of research papers and citations

#### Strengths for PhD in Mechanical Engineering

Research and teaching are very well integrated. This allows the staff to teach innovative courses that follow the state-of-the art

#### 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.*

#### Areas of improvement and recommendations for BSc in Mechanical Engineering

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

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.

Areas of improvement and recommendations for MSc in Energy Engineering

After the virtual visit and the interviews it seems that there are not many problems detected.

Some general points to be considered at an appropriate point of time (and when and where applicable):

The Department can consider a joint points system for teaching and participation in administrative tasks.

The Department can consider retaining a fixed ratio of students registered in a class per number of lecturers and apply that rule even to courses where a large number of students attends the course because of resits.

Involvement of visiting staff in the teaching of the courses

Providing pedagogical training of the teaching staff including training in the use of innovative teaching methods.

Areas of improvement and recommendations for PhD in Mechanical Engineering

There is not much to improve at this stage.

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

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>		
		<i>BSc in Mechanical Engineering</i>	<i>MSc in Energy Engineering</i>	<i>PhD in Mechanical Engineering</i>
<b>3.1</b>	Teaching staff recruitment and development	Compliant	Compliant	Compliant
<b>3.2</b>	Teaching staff number and status	Compliant	Compliant	Compliant
<b>3.3</b>	Synergies of teaching and research	Compliant	Compliant	Compliant

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

##### Sub-areas

**4.1. Student admission, processes and criteria**

**4.2. Student progression**

**4.3. Student recognition**

**4.4. Student certification**

##### **4.1 Student admission, processes and criteria**

###### Standards

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

##### **4.2 Student progression**

###### Standards

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

##### **4.3 Student recognition**

###### Standards

- *Pre-defined and published regulations regarding student recognition are in place.*
- *Fair recognition of higher education qualifications, periods of study and prior learning, including the recognition of non-formal and informal learning, are essential components for ensuring the students' progress in their studies, while promoting mobility.*
- *Appropriate recognition procedures are in place that rely on:*
  - *institutional practice for recognition being in line with the principles of the Lisbon Recognition Convention*
  - *cooperation with other institutions, quality assurance agencies and the national ENIC/NARIC centre with a view to ensuring coherent recognition across the country*

#### 4.4 Student certification

##### Standards

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

*You may also consider the following questions:*

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

##### Findings

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

##### Findings for BSc in Mechanical Engineering

The BSc programme seems to have transparent policies and criteria along with consistent established procedures for student admission, progression, recognition, and certification. These are evident from the submitted formal documentation and information on the website of FU. Indirect evidence of the robustness of admission procedures and adequate student progression practices can be found from the low drop-out rate of admitted students.

##### Findings for MSc in Energy Engineering

The admittance to the MSc program follows evaluation by a committee under criteria related to the academic qualifications and grade of the candidate and reference letters. The information about the requirements is clearly stated and publicly available.

The student progression is again defined clearly for the MSc program. Students are expected to pass each of the compulsory and the required number of elective modules. This results in very clear conditions for progression.

The available material on the programme is considered adequate for students.

Material is available in the programme's website, on general information, programme of studies, admissions, news and announcements, and communication details.

Administrative personnel are competent to provide student support.

**Findings for PhD in Mechanical Engineering**

The PhD student progression involves comprehensive examinations that have an advisory role during the progress of the PhD, the allocation of a 3-member supervisory committee and a defense of the thesis in front of a 5-member Examination Board that includes external examiners. Hence, the process has multiple control and advisory to the PhD student points.

**Strengths**

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

**Strengths for BSc in Mechanical Engineering**

Good reputation of the BSc programme among young people in the local community and low drop-out rate among students admitted to the BSc programme.

**Strengths for MSc in Energy Engineering**

A reasonable number of students admitted in the M.Sc after careful evaluation

**Strengths for PhD in Mechanical Engineering**

Multiple control points of the progress of PhD candidates are included in the organization of the PhD programme.

**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.*

**Areas of improvement and recommendations for BSc in Mechanical Engineering**

The established routines seem to be functioning adequately.

**Areas of improvement and recommendations for MSc in Energy Engineering**

The system seems working in an efficient manner on that matter.

**Areas of improvement and recommendations for PhD in Mechanical Engineering**

The faculty involved in the programme and the department are encouraged to undertake actions to increase the visibility of the PhD programme.

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



Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>		
		<i>BSc in Mechanical Engineering</i>	<i>MSc in Energy Engineering</i>	<i>PhD in Mechanical Engineering</i>
<b>4.1</b>	Student admission, processes and criteria	Compliant	Compliant	Compliant
<b>4.2</b>	Student progression	Compliant	Compliant	Compliant
<b>4.3</b>	Student recognition	Compliant	Compliant	Compliant
<b>4.4</b>	Student certification	Compliant	Compliant	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.*

#### Findings for BSc in Mechanical Engineering

The examination of formal documents submitted for the BSc programme evaluation along with online meetings including virtual visit to the teaching and laboratory facilities prove that DME possesses all teaching and learning as well as support resources necessary for adequate student education.

Available classrooms and laboratory facilities have capacities exceeding the needs at present, which leaves space for the programme growth. Some of the laboratory facilities are unique for Cyprus and even beyond, which gives students excellent opportunities and a competitive advantage. Steady and significant investments along with strong commitment of DME personnel in developing these facilities give excellent perspective for the improvement of the programme competitiveness. It was also very interesting to learn about the existence of a “racing car” program within which students have excellent opportunities for implementing the obtained knowledge in practice by building a race car. The availability of such programs is still rare Globally, which again increases the strength, attractiveness, and value of the BSc program under evaluation.

The students studying on this BSc programme also have adequate access to libraries, software, and other IT resources necessary for their studies. Moreover, available recourses and pro-active efforts of personnel involved in the program have been allowing to maintain adequate teaching routines even during the COVID-19 pandemic.

#### Findings for MSc in Energy Engineering

During the virtual site visit of the evaluation committee and after review of pertinent material distributed to the committee, it is evident that the teaching and learning resources offered by the department to students meet the standards seen in high-profile universities.

The students are well informed regarding the available resources to them during classes. Moreover, the library services organize regular information sessions. The library services ensure access to a large volume of textbooks and other material. Moreover, the IT infrastructure is sufficient including multiple workstations, access to pertinent software that is currently used in the research and practice communities.

With regard to teaching materials and equipment, the faculty maintains and constantly improves them to ensure the high quality of the education process. It is evident that the condition of classrooms, lab spaces for teaching and research purposes is very good.

Finally, after careful evaluation and comparison with a number of universities in Europe, it is evident that proper procedures have been established to ensure a seamless transition to meet demands in case that student number(s) change or in operations under special circumstances such as the COVID-19 pandemic period.

Generally, there is an excellent availability of accessible resources for achieving the objectives of this programme. Students have access to numerous appropriate research laboratories for their coursework and theses. There is a substantial amount of digital and technical equipment for the students to use for monitoring and testing with several workshops for physical manufacture of models.

Students are supported by a range of well-qualified full-time staff.

#### Findings for PhD in Mechanical Engineering

The above observations apply here as well.



## **Strengths**

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

### **Strengths for BSc in Mechanical Engineering**

Excellent experimental facilities making the program competitive in the region and beyond.

Plentiful human resources exceeding present needs of the BSc programme and thus providing excellent potential for growth.

### **Strengths for MSc in Energy Engineering**

Exceptional quality of teaching and research labs that ensure high-quality hands-on experience in teaching and research

Effective use of student evaluations to ensure high quality of teaching across programmes

The library offers many customized services for students, researchers, faculty and visitors, including ways to trace plagiarism in student works, consultations with a librarian, training sessions, guides and tutorials, remote services.

Lab and project work resources provide an excellent vehicle for teaching interdisciplinary collaboration skills and developing this perspective in professional teamwork.

### **Strengths for PhD in Mechanical Engineering**

Exceptional quality of teaching and research labs that ensure high-quality hands-on experience in teaching and research.

## **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.*

### **Areas of improvement and recommendations for BSc in Mechanical Engineering**

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.

### **Areas of improvement and recommendations for MSc in Energy Engineering**

One recommendation for potential future improvements could be the development of Massive Open Online Courses (MOOC), which might be great resource in current efforts with regard to digital education that would further strengthen the current offer of distance learning.

Areas of improvement and recommendations for PhD in Mechanical Engineering

N/A.

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

Sub-area		<i>Non-compliant/ Partially Compliant/Compliant</i>		
		<i>BSc in Mechanical Engineering</i>	<i>MSc in Energy Engineering</i>	<i>PhD in Mechanical Engineering</i>
5.1	Teaching and Learning resources	Compliant	Compliant	Compliant
5.2	Physical resources	Compliant	Compliant	Compliant
5.3	Human support resources	Compliant	Compliant	Compliant
5.4	Student support	Compliant	Compliant	Compliant

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

### Sub-areas

#### 6.1. Selection criteria and requirements

#### 6.2. Proposal and dissertation

#### 6.3. Supervision and committees

### 6.1 Selection criteria and requirements

#### Standards

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

### 6.2 Proposal and dissertation

#### Standards

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

### 6.3 Supervision and committees

#### Standards

- *The composition, the procedure and the criteria for the formation of the advisory committee (to whom the doctoral student submits the research proposal) are determined.*
- *The composition, the procedure and the criteria for the formation of the examining committee (to whom the doctoral student defends his/her dissertation), are determined.*

- *The duties of the supervisor-chairperson and the other members of the advisory committee towards the student are determined and include:*
  - *regular meetings*
  - *reports per semester and feedback from supervisors*
  - *support for writing research papers*
  - *participation in conferences*
- *The number of doctoral students that each chairperson supervises at the same time are determined.*

*You may also consider the following questions:*

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

### Findings

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

The PhD programme has been established to secure admission to high calibre graduate students. Besides detailed bachelor's and Master's degree titles, a list of reference letters is required along with certificates of proficiency in Greek and English. Moreover, candidates are required to submit a research statement on the particular reasons for selecting the program as well as their research interests. A full-time PhD student completes, on average, the PhD degree in about 4 years.

PhD candidates have access to established guidelines on how to write a dissertation.

PhD candidates generally follow the standard procedures established by the university library to submit their dissertation.

To ensure proper training and supervision, the PhD student progression involves comprehensive examinations that have an advisory role early on during the progress of the PhD, the allocation of a 3-member supervisory committee and a defence of the thesis in front of a 5-member Examination Board that includes external examiners. Hence, the process has multiple control and advisory to the PhD student points.

Moreover, doctoral students are required to take sufficient coursework from a variety of electives to best fulfil the research needs of their work. The above are well developed mechanisms to ensure a high scientific quality of a PhD thesis work.



Supervisors meet regularly with their students to evaluate progress over the course of a PhD thesis and provide constant feedback to doctoral students. Based on sufficient evidence presented during the virtual visit, it is clear that students and supervisors publish in high quality peer-reviewed journals in their respective disciplines.

### Strengths

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

- 1) Well-established examination mechanisms for doctoral students to ensure a successful path during a PhDthesis.
- 2) Active participation in conferences and scientific meetings to ensure dissemination of research findings.
- 3) Regular publications in high-quality peer-reviewed journals.
- 4) Financial resources to doctoral students are sufficient for them to focus on their research work.

### 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 committee believes that the department has established a successful path to ensure a high-quality doctoral degree program.

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

Sub-areas		<i>Non-compliant/ Partially Compliant/Compliant</i>
<b>6.1</b>	Selection criteria and requirements	Compliant
<b>6.2</b>	Proposal and dissertation	Compliant
<b>6.3</b>	Supervision and committees	Compliant

## D. Conclusions and final remarks

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

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 4<sup>th</sup> 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.



**E. Signatures of the EEC**

<i>Name</i>	<i>Signature</i>
<b>Nicolas Moussiopoulos</b>	
<b>Dimitrios Kyritsis</b>	
<b>Dmytro Orlov</b>	
<b>Iakovos Christodoulou</b>	
<b>Panagiotis Chrysanthou</b>	
Click to enter <b>Name</b>	

**Date:** 2022-01-16

