



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
HELLENIC REPUBLIC



**Εθνική Αρχή
Ανώτατης Εκπαίδευσης**
Hellenic Authority
for Higher Education

Αριστειδου 1 & Ευριπίδου 2 • 10559 Αθήνα | 1 Aristidou str. & 2 Evripidou str. • 10559 Athens, Greece
T. +30 210 9220 944 • **F.** +30 210 9220 143 • **E.** secretariat@ethaae.gr • www.ethaae.gr

Accreditation Report
for the Undergraduate Study Programme
(Integrated Master) of:

Mechanical Engineering
Institution: University of Western Macedonia
Date: 27 March 2021

Report of the Panel appointed by the HAHE to undertake the review of the Undergraduate Study Programme (Integrated Master) of **Mechanical Engineering** of the **University of Western Macedonia** for the purposes of granting accreditation

Abbreviations

UOWM	University of Western Macedonia
ECTS	European Credit Transfer System
EEAP	External Evaluation & Accreditation Panel
EDIP	Laboratory Teaching Staff
ETEP	Laboratory Technicians
HAHE	Hellenic Authority for Higher Education
HNARIC	Hellenic National Recognition and Information Centre
IQAS (ΕΣΔΠ)	Internal Quality Assurance System
MENG/UOWM	Department of Mechanical Engineering at UOWM
MODIP	Quality Assurance Unit (ΜΟΔΙΠ)
OMEA	Internal Evaluation Groups/School's Internal Evaluation Committee
QA	Quality Assurance
SA	Scientific Associates

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PART A: BACKGROUND AND CONTEXT OF THE REVIEW

I. The External Evaluation & Accreditation Panel

The Panel responsible for the Accreditation Review of the Undergraduate Study Programme (Integrated Master) of **Mechanical Engineering** of the **University of Western Macedonia** comprised the following four (4) members, drawn from the HAHE Register, in accordance with Laws 4009/2011 & 4653/2020:

- 1. Prof. George Aggidis (Chair)**
Lancaster University, United Kingdom

- 2. Prof. Ioannis Botsis**
École Polytechnique Fédérale de Lausanne, Switzerland

- 3. Prof. Konstantinos Kontis**
University of Glasgow, United Kingdom

- 4. Mr. Leonidas-Gerasimos Travlos**
Member of the Technical Chamber of Greece, Greece

II. Review Procedure and Documentation

The Hellenic Authority for Higher Education (HAHE) formed an External Evaluation & Accreditation Panel (EEAP) of experts to assess the compliance of the Internal Quality Assurance System (IQAS) of the Undergraduate Study Programme (Integrated Master) of **Mechanical Engineering** of the **University of Western Macedonia** in accordance with the HAHE Quality Assurance (QA) requirements. The assessment was conducted remotely via Zoom. The method used was based on sampling of the activities of MENG/UOWM to evaluate the fulfilment of the HAHE requirements of the relevant Quality Standards, and comment on its compliance, effectiveness, efficiency and applicability with respect to the chosen requirements.

The review procedure and documentation were carried out during the March 22 to March 27, 2021 period.

On March 22, 2021:

The EEAP members met and discussed the standards and guidelines of the QA accreditation process as well as the logistics associated with the compilation of the report.

On March 23, 2021:

The 4-member EEAP met with:

The Vice-Rector/President of MODIP and the Head of Department:

- *Vice-Rector of Academic Affairs and President of MODIP, Prof. Nikolaos Sariannidis*
- *Head of MENG/UOWM, Assoc. Prof. George Nenes*

During this meeting, Prof. Sariannidis and Assoc. Prof. Nenes gave short but very useful presentations providing an overview of UOWM and MENG/UOWM. The presentations were followed by an informative discussion.

The OMEA and MODIP Representatives:

- *Prof. Taousanidis Nikolaos, President of OMEA*
- *Prof. Sapidis Nikolaos, OMEA member*
- *Assoc. Prof. Nenes George, OMEA member / Head of the Department*
- *Ms. Tzika Anna, OMEA member, Head of the Administration Office*
- *Ms. Kostis Paraskevi, OMEA member, Students' representative*
- *Prof. Sariannidis Nikolaos, Vice-Rector of Academic Affairs / President of MODIP*
- *Assoc. Prof. Kapageridis Ioannis, MODIP member*
- *Assoc. Prof. Zygkiridis Theodoros, MODIP member*
- *Dr. Orovas Christos, MODIP member / Laboratory Teaching Staff representative*

- *Mr. Kalogeras Dionisios, Administrative Staff of MODIP*
- *Mr. Karagiannis Panagiotis, Administrative Staff of MODIP*
- *Ms. Koutziakoutzidou Christina, Administrative Staff of MODIP*

Professors Sariannidis and Taousanidis gave detailed presentations outlining the activities of MODIP and OMEA respectively, followed by informative discussions that were mainly focused on questions raised by the EEAP members.

Teaching staff members of MENG/UOWM:

- *Prof. Marnellos George*
- *Prof. Maropoulos Stergios*
- *Prof. Theodoulidis Theodoros*
- *Prof. Tourlidakis Antonios*
- *Assoc. Prof. Giagopoulos Dimitrios*
- *Assoc. Prof. Konstantinidis Efstathios*
- *Assoc. Prof. Kontogianni Areti*
- *Assoc. Prof. Panagiotidou Sofia*
- *Asst. Prof. Krestou Athina*
- *Asst. Prof. Panaras George Asst.*
- *Prof. Sotiropoulou Rafaella Eleni*
- *Asst. Prof. Tsouknidas Alexandros*

Professors Tourlidakis and Theodoulidis gave a short discussion outlining the teaching activities and associated metrics of MENG/UOWM. An informative discussion related to the Department's role in ensuring quality with respect to the specific educational objectives followed.

A Group of Undergraduate Students:

During the meeting with the undergraduate students, valuable input was provided to EEAP regarding the educational activities in MENG/UOWM.

On March 24, 2021:

The 4-member EEAP met with:

Administrative Staff Members and Teaching Staff Members

- *Prof. Marnellos George*
- *Prof. Maropoulos Stergios*
- *Prof. Tourlidakis Antonios*
- *Assoc. Prof. Giagopoulos Dimitrios*

- *Assoc. Prof. Konstantinidis Efstathios*
- *Assoc. Prof. Panagiotidou Sofia*
- *Asst. Prof. Panaras George*
- *Asst. Prof. Sotiropoulou Rafaella Eleni*
- *Asst. Prof. Tsouknidas Alexandros*
- *Ms. Tzika Anna, Head of the Administration Office*
- *Ms. Stergiopoulou Angeliki, Administrative staff*
- *Mr. Mingos Michalis, IT*

A Group of Programme Graduates:

- *Mr. Balachtsis Vasilios, Innovation Manager at Mader GmbH & Co KG, Stuttgart, Germany*
- *Mr. Dalgalis Christos, Liftra SL, Engineering Manager*
- *Mr. Georgopoulos Prodromos, Master's student, Eindhoven University of Technology, Netherlands*
- *Mr. Kolonelos Panagiotis, Western Macedonia Region*
- *Mr. Koutsakis George, PhD candidate at the Engine Research Center, Madison, Wisconsin USA*
- *Mr. Martinos Alexis, PhD Candidate, Engler-Bunte-Institute of the Karlsruhe Institute of Technology, Germany*
- *Ms. Nianioura Athanasia, Dassault Systèmes, Senior Application Engineer*
- *Mr. Peitzikas Nikolaos, Mechanical Analyst-Stress Belcan, Glasgow, UK*
- *Mr. Ridvald Dhimo, Key Account Manager at Toshiba Corporation, Kensal Green, UK*
- *Ms. Tsotalou Mary, MSc student, Business Analytics, Imperial College London Business School*
- *Mr. Vitlaris Dimitrios, Research Assistant in Computational Multi-physics Modelling, Cranfield University*

Representatives of a Number of Employers and Social Partners:

- *Mr. Efthymiadis Simos, ELINOIL S.A., Deputy Operations Manager*
- *Mr. Gosliopoulos Michalis, Trans Adriatic Pipeline - TAP AG, Community Liaison Coordinator for Western Macedonia*
- *Mr. Grompanopoulos Konstantinos, PPC S.A. (ΔΕΗ Α.Ε.), Director of the Production Assets Withdrawal Management Department*
- *Mr. Hatzipanagiotou Theodoros, SOLARIS Hellas, subsidiary of SOLARIS BUS & COACH, Board Member*
- *Mr. Kianas Stergios, President of the Regional Department of Western Macedonia of the Technical Chamber of Greece*
- *Mr. Kotouzas Apostolos, TQCC Consulting Services, NDT Training & Certification, General Manager*
- *Ms. Kyriakidou Kalliopi, Region of Western Macedonia, Vice Governor for Energy, Infrastructure & Environment*
- *Mr. Tassios Christos, BETA CAE SYSTEMS, Corporate Relations*
- *Mr. Tyriakidis Vasileios, B&T COMPOSITES S.A., Chairman and CEO*
- *Mr. Zotos Manos, Kleeman Hellas, Group Innovation Manager*

During the above-mentioned meetings, valuable input was provided to EEAP regarding the educational activities in MENG/UOWM. During the meeting with the Administrative Staff Members and Teaching Staff Members, the EEAP members were given an on-line tour of various relevant facilities. Then EEAP members met with a Group of Programme Graduates followed with a meeting with Representatives of a Number of Employers and Social Partners that also provided positive input for the EEAP members to consider.

On March 24, 2021:

The 4-member EEAP also met with:

OMEA and MODIP members and MODIP staff

OMEA Members

- *Prof. Taousanidis Nikolaos, President of OMEA*
- *Prof. Sapidis Nikolaos, OMEA member*
- *Assoc. Prof. Nenes George, OMEA member*
- *Ms. Tzika Anna, OMEA member, Head of the Administration Office*
- *Ms. Kosti Paraskevi, OMEA member, Students' representative*

MODIP Members

- *Prof. Sariannidis Nikolaos, Vice-Rector of Academic Affairs / President of MODIP*
- *Assoc. Prof. Kapageridis Ioannis, MODIP member*
- *Assoc. Prof. Zygkiridis Theodoros, MODIP member*
- *Dr. Orovas Christos, MODIP member-Laboratory Teaching Staff representative*

MODIP Staff

- *Mr. Kalogeras Dionisios, Administrative Staff of MODIP*
- *Mr. Karagiannis Panagiotis, Administrative Staff of MODIP*
- *Ms. Koutziakoutzidou Christina, Administrative Staff of MODIP*

EEAP met with the OMEA members to discuss points that needed further clarification or quantification. The EEAP visit ended with a final joint meeting with the OMEA and MODIP members and MODIP staff, Vice-Rector of Academic Affairs and President of MODIP Prof. Sariannidis Nikolaos, and the Head of MENG/UOWM Assoc. Prof. Nenes George to discuss key findings.

Material provided by OMEA:

- B0.Πίνακας_Περιεχομένων
- B1.Πρόταση_Ακαδημαϊκής_Πιστοποίησης
- B2.Πολιτική_Ποιότητας
- B3.1.Οδηγός Σπουδών_2018-19
- B3.2.Οδηγός Σπουδών_2019-20
- B4.1.Κανονισμός_ΠΠΣ

- B4.2.Κανονισμός_Διεξαγωγής_Εξετάσεων
- B4.3.Κανονισμός_Εκπόνησης_Διπλωματικών_Εργασιών
- B4.4.Κανονισμό_Χρήσης_Υπολογιστικών_Κέντρων
- B4.5.Πλαίσιο_Λειτουργίας_Πρακτικής_Άσκησης
- B4.6.Κανονισμός_Επιλεξιμότητας_Εξερχόμενων_Φοιτητών_για_Διδασκαλία_στο_πλαί-
σιο_του_Erasmus+
- B4.7.
Κανονισμός_Επιλεξιμότητας_Εξερχόμενων_Φοιτητών_για_Πρακτική_Άσκηση_στο-
πλαίσιο_του_Erasmus+
- B5.Περιγράμματα_Μαθημάτων
- B6.Στοχοθεσία_Ποιότητας
- B7.Υποδείγματα_Ερωτηματολογίων_και_Επεξεργασία
- B8. ΠΡΑΚΤΙΚΟ ΜΟΔΙΠ ΤΜΜ
- B9.Αναφορές_Δεδομένων_ΟΠΕΣΠ
- B10.1.Ερευνητικό_Έργο_2013-2018
- B10.2.Μελέτη_Απορρόφησης_ΤΜΜ
- B11.Πρόσθετοι_Όροι

Material provided by HAHE:

- European Qualifications Framework
- ODIGOS PISTOPOIISIS_en
- Standards for Quality Assurance of Undergraduate Programmes_EN
- P12a_Guidelines for the Accreditation Panel
- P13_MAPPING GRID
- P14_INTEG_Template for the Accreditation Report
- UniWestMaced_MechEng_2013
- ΠΔΜ Δ2017 ΠΠΣ Μηχανολόγων Μηχανικών 210208
- ΠΔΜ Δ2017 ΤΜΗΜΑ Μηχανολόγων Μηχανικών 210208
- ΠΔΜ Δ2018 ΠΠΣ Μηχανολόγων Μηχανικών 210208
- ΠΔΜ Δ2018 ΤΜΗΜΑ Μηχανολόγων Μηχανικών 210208
- ΠΔΜ Δ2019 ΠΠΣ Μηχανολόγων Μηχανικών 210208
- ΠΔΜ Δ2019 ΤΜΗΜΑ Μηχανολόγων Μηχανικών 210208
- ΠΔΜ Δ2020 ΠΠΣ Μηχανολόγων Μηχανικών 210208
- ΠΔΜ Δ2020 ΤΜΗΜΑ Μηχανολόγων Μηχανικών 210208

Moreover, at the EEAP's request, the following information was made available during the visit:

- Παρουσίαση του Προέδρου ΜΟΔΙΠ για ΠΠΣ (2) - The presentation given by the Vice-Rector of Academic Affairs and President of MODIP, Prof. Nikolaos Sariannidis.
- Presentation OMEA 2021-accreditation - The presentation given by the Prof. Taousanidis Nikolaos, President of OMEA.
- TMM-presentation-2021-accreditation-Head of the Department - by the Head of MENG/UOWM Assoc. Prof. Nenes George.

- TMM-presentation-2021-DEP - Presentation containing brief CVs of the MENG/UOWM academic staff.

III. Study Programme Profile

Context

The Department was created in 1999 with a different name and has struggled valiantly to develop under often difficult and uncertain conditions. It is making very commendable efforts to reach a critical and sustainable size under the new catastrophic economic conditions of the country, with the University located at two different cities (Kozani and Florina), and the Department spread all over town in Kozani, at four different buildings.

At the time of its creation, in 1999, the Department was an independent unit of the Aristotle University of Thessaloniki (AUTH). It was attached to the University of Western Macedonia (UWM) in 2004, contrary to the wishes of the faculty that preferred its former status. The merger of the various departments in Florina and Kozani created a highly inhomogeneous University at two different cities, governed, due to its insufficient size, by a Governing Board, rather than being autonomous.

The Department was renamed in 2008 from Department of Engineering of Energy Resources and Management to Mechanical Engineering (ME). The reasons included professional ones (degree recognition by the Technical Chamber of Greece, TEE); adjustments of the Curriculum were required to make it compatible with the name of the Department. The strong emphasis on energy in teaching and research remains, however. The region of Kozani plays a dominant role in energy in Greece, as is the centre of production of a very high fraction of the electricity and it is also involved in the production or transit of other forms of primary energy, including renewable ones. MENG/UOWM keeps close contacts to the national utility, the Public Power Corporation (DEH for short) as well as to other heavy industries and local organizations. DEH is participating in several activities of MENG/UOWM, most recently by remarkably funding three chairs for four years, something rather unusual in Greece, for which the Department should be commended.

There were plans to build a campus on designated, available land, with the existence of substantial funding from the National Strategic Reference Framework (ΕΣΠΑ or ESPA for short). Currently, the new campus is almost complete with a plan to transfer to the new campus within 2021. The Department was not designated in the past as a first choice in the national entrance examination system (for geographical and other reasons) while today this trend is reversing. The possibility of transfer (μεταγραφές) of a certain category of “disadvantaged” students to other universities has created a haemorrhage of the student body in Kozani.

The geographical separation of the various facilities of MENG/UOWM creates many practical difficulties to the faculty and to the student body. In Kozani, UOWM is spread in six different locations (mostly in rented buildings that burden the budget in rents and heating costs – about half of the total budget!). MENG/UOWM could benefit with additional administrative and support personnel, to bring it in par with other comparable departments.

In spite of these great difficulties, MENG/UOWM has grown from its initial rudimentary state to an acceptable one and is managing well its activities.

The UOWM has implemented the Law 4009/2011 bringing several reforms to the governance of the universities that will also benefit the MENG/UOWM.

The MENG/UOWM today

UOWM is one University that is spread in the 5 Greek cities of Kozani, Grevena, Kastoria, Florina and Ptolemaida. It comprises 7 Schools and 22 Departments having 42 laboratories and 27 postgraduate study programmes with 13.091 undergraduate, 2.552 postgraduate, 316 PhD students and 9 postdoctoral researchers, supported by 194 Faculty members, 74 ΕΔΙΠ members and 143 Administrative Staff.

MENG/UOWM comprises 3 Sectors (Design and Construction 24%, Energy Supply & Transfer and Energy Environment & Use 52%, and Industrial Management 24%). The nominal duration of studies is 5 years, and a student is considered as “active” up to Year $v+2$ where $v = 5$. The total number of students is 507 (448 male and 59 female) where 386 (v) and 414 ($v+2$). The student per academic staff ratio is 21.1 ($v=11.9$ and $v+2=17.3$). The student per teaching staff ratio is 13.3 ($v=7.5$ and $v+2=10.9$). The percentage of first year students over the total number of students is 12% ($v=21\%$ and $v+2=14\%$). The ratio of male to female students is approximately 88/12.

MENG/UOWM activities are supported currently by 24 academic staff (1 Lecturer, 8 Assistant, 6 Associate and 9 Full Professors), 3 EDIP members, 5 ETEP members, 7 SA, 42 external collaborators for research, 31 external collaborators for administrative and support duties and 3 administrative staff.

The number of admitted students in Year 1 (through the National Entrance Examinations) is around 160 (2020-2021). There is also a number of students of around 100 that will request a transfer to other universities mainly to the National Technical University of Athens and the Aristotle University of Thessaloniki.

MENG/UOWM is aiming to reduce this transfer of students to other universities by introducing a series of beneficial measures for the students to remain at MENG/UOWM including flexible organisation, open door policy of academic staff for students, taking advantage of being at the energy heart of the country, looking after the students’ needs, promoting Kozani as an ideal city for student life, having new staff with great teaching interest and skills, new buildings (ΖΕΠ) and introducing new equipment and state of the art laboratories.

The research profile of the MENG/UOWM indicates a healthy activity as measured by metrics on research average outputs in total so far, like journals (29), conferences (13) and citations (673) per academic member of staff (22).

PART B: COMPLIANCE WITH THE PRINCIPLES

Principle 1: Academic Unit Policy for Quality Assurance

INSTITUTIONS SHOULD APPLY A QUALITY ASSURANCE POLICY AS PART OF THEIR STRATEGIC MANAGEMENT. THIS POLICY SHOULD EXPAND AND BE AIMED (WITH THE COLLABORATION OF EXTERNAL STAKEHOLDERS) AT ALL INSTITUTION'S AREAS OF ACTIVITY, AND PARTICULARLY AT THE FULFILMENT OF QUALITY REQUIREMENTS OF UNDERGRADUATE PROGRAMMES. THIS POLICY SHOULD BE PUBLISHED AND IMPLEMENTED BY ALL STAKEHOLDERS.

The quality assurance policy of the academic unit is in line with the Institutional policy on quality, and is included in a published statement that is implemented by all stakeholders. It focuses on the achievement of special objectives related to the quality assurance of study programmes offered by the academic unit.

The quality policy statement of the academic unit includes its commitment to implement a quality policy that will promote the academic profile and orientation of the programme, its purpose and field of study; it will realise the programme's strategic goals and it will determine the means and ways for attaining them; it will implement the appropriate quality procedures, aiming at the programme's continuous improvement.

In particular, in order to carry out this policy, the academic unit commits itself to put into practice quality procedures that will demonstrate:

- a) the suitability of the structure and organization of the curriculum;*
- b) the pursuit of learning outcomes and qualifications in accordance with the European and the National Qualifications Framework for Higher Education;*
- c) the promotion of the quality and effectiveness of teaching;*
- d) the appropriateness of the qualifications of the teaching staff;*
- e) the enhancement of the quality and quantity of the research output among faculty members of the academic unit;*
- f) ways for linking teaching and research;*
- g) the level of demand for qualifications acquired by graduates, in the labour market;*
- h) the quality of support services such as the administrative services, the Library, and the student welfare office;*
- i) the conduct of an annual review and an internal audit of the quality assurance system of the undergraduate programme(s) offered, as well as the collaboration of the Internal Evaluation Group (IEG) with the Institution's Quality Assurance Unit (QAU).*

Study Programme Compliance

The QA policy of MENG/UOWM is harmonized with that of UOWM. This policy is both in line with the relevant government directives, as well as with the principles and guidelines for quality assurance of the European Higher Education Area (ESG 2015) and is in accordance with the requirements of HAHE. MENG/UOWM is committed to the implementation and improvement of the Quality Management System (QMS).

MENG/UOWM leadership sets the goals and all necessary measures and actions needed to achieve the objectives of the QA policy. There is an intensive and systematic evaluation of the quality of the work of MENG/UOWM, through the internal evaluation process, which is based on the completion of questionnaires, the observation of teaching by colleagues or invited observers, the direct monitoring of student progress through mentorship, direct communication and open discussion with students, including feedback from students in electronic format. There is an annual collection and review of qualitative and quantitative data by the OMEA for the formulation of proposals for further improvement.

Improvement and review of courses is done on a regular basis, supporting and encouraging teaching staff to make the most of its potential e-class platform, and adoption of the latest pedagogical practices. It provides opportunities to the academic staff for training and gaining further experience, through participation in conferences, training seminars and related mobility programmes (e.g., Erasmus). MENG/UOWM aspires to continuously improve the quality of learning and research provision. MENG/UOWM pursues research collaborations with companies and industries, especially in the region of Western Macedonia. The quantitative record of many of the above objectives is included in the available documentation.

The QA policy is posted on the MENG/UOWM website. The Chair of MENG/UOWM together with the academic staff is responsible for disseminating the vision and underpinning procedures provided by the QA policy and keeping the students informed through workshops and tutorials.

Panel Judgement

Principle 1: Institution Policy for Quality Assurance	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

None.

Principle 2: Design and Approval of Programmes

INSTITUTIONS SHOULD DEVELOP THEIR UNDERGRADUATE PROGRAMMES FOLLOWING A DEFINED WRITTEN PROCESS WHICH WILL INVOLVE THE PARTICIPANTS, INFORMATION SOURCES AND THE APPROVAL COMMITTEES FOR THE PROGRAMME. THE OBJECTIVES, THE EXPECTED LEARNING OUTCOMES, THE INTENDED PROFESSIONAL QUALIFICATIONS AND THE WAYS TO ACHIEVE THEM ARE SET OUT IN THE PROGRAMME DESIGN. THE ABOVE DETAILS AS WELL AS INFORMATION ON THE PROGRAMME'S STRUCTURE ARE PUBLISHED IN THE STUDENT GUIDE.

Academic units develop their programmes following a well-defined procedure. The academic profile and orientation of the programme, the objectives, the subject areas, the structure and organisation, the expected learning outcomes and the intended professional qualifications according to the National Qualifications Framework for Higher Education are described at this stage. The approval or revision process for programmes includes a check of compliance with the basic requirements described in the Standards, on behalf of the Institution's Quality Assurance Unit (QAU).

Furthermore, the programme design should take into consideration the following:

- *the Institutional strategy*
- *the active participation of students*
- *the experience of external stakeholders from the labour market*
- *the smooth progression of students throughout the stages of the programme*
- *the anticipated student workload according to the European Credit Transfer and Accumulation System*
- *the option to provide work experience to the students*
- *the linking of teaching and research*
- *the relevant regulatory framework and the official procedure for the approval of the programme by the Institution*

Study Programme Compliance

EEAP reviewed the undergraduate programme of MENG/UOWM and has concluded that it overall fulfils the requirements for accreditation. The curriculum aims at providing a quality and in-depth education of the students in this field. There is an appropriate number of modules (μαθήματα) that expand over three MENG/UOWM Sectors; each Sector comprises a number of specialisation streams. These consider the scientific advancements in their corresponding areas but also the needs of the Greek economic area and relevant businesses. The theoretical background and fundamental knowledge are addressed mainly during the first 3 years of studies, while the last two years are devoted to a number of specialisation streams. Moreover, interdisciplinary subjects that cross over traditional boundaries could further improve the curriculum.

UOWM advised EEAP that its strategy includes quality of education, academic performance of the students, link education with research, student employability and infrastructure and

operational/administrative support. MENG/UOWM is committed to improve these areas continuously.

On the active participation of students and from discussions with the staff members and interviews with the students, EEAP concluded that although participation in lectures is not mandatory, the large majority of the active students participates in classes. Students have enthusiastically described the efforts of academic staff to engage them in their classes and their open-door policy; special mentioning was made to group projects that lead to design and testing of actual components.

EEAP had a discussion with the invited stakeholders; these covered representatives from both traditional/local businesses, where the daily work of the employed engineers does not necessarily require knowledge of high-end technological applications and high-end spin-out companies and internationally leading scientific software developers, where knowledge in specialized scientific topics of the employers is a prerequisite. All of them, with no exception, have outspoken the high quality and in-depth knowledge of the graduates. Stakeholders have praised the collaboration they have with the academic staff and the open dialogue that considers their needs in the curriculum of MENG/UOWM.

The progression of the students is an area that improvements are necessary. This situation creates obvious difficulties, both to the student's further development but also to the operation of MENG/UOWM. The reasons for this situation are mainly related to factors outside the influence of MENG/UOWM.

On the anticipated student workload according to the European Credit Transfer System (ECTS), 300 ECTS credits are required for graduation. 180 ECTS are completed during the 1st Study Cycle (1st, 2nd and 3rd years of study) attending 33 modules. 60 ECTS are completed during the 2nd Study Cycle (4th year of study) attending 6 compulsory modules + 2 optional modules in addition to the 4 optional modules on Mechanical Design. 60 ECTS are completed during the 3rd Study Cycle (5th year of study) attending 2 compulsory modules + 2 optional modules in addition to 2 general optional modules and 30 ECTS from the Diploma Thesis. ECTS are almost evenly distributed across modules. EEAP concluded that the set targets are realistic and in agreement with international practices.

The MENG/UOWM curriculum in addition provides the option to the students for work experience through the provision of a 3-month practical experience in industry for students that have completed their 3rd year of study through the ΕΣΠΑ programme (about 15 students per year), or via Erasmus, for students that have completed their 2nd year of study. Both students and stakeholders have positively spoken about the involvement of students during their studies in their premises as part of the practical exercise. MENG/UOWM also provides a link between teaching and research. Active participation in research projects typically takes place during the Diploma Thesis. MENG/UOWM has already 43 completed PhD Theses and currently 40 PhD students progressing with their respective research theme. In addition, it was described that it

is common practice to involve the most research-oriented students to participate and become actively involved with research projects, as this may lead to an increase of the much required and well-trained Doctoral students for MENG/UOWM.

MENG/UOWM has an impressive presence in international student competition with significant awards including the Typhoon motorbike racing team and the forthcoming European formula student team. To accomplish these interdisciplinary team-work projects, application or high-end research tools and research methods is a prerequisite.

Regarding the relevant regulatory framework and the official procedure for the approval of the programme by UOWM, the review and renewal/approval of the programme of studies takes place almost every academic year. The process follows consultation with all academic staff members as well as with MODIP, following an established protocol. Following submission of the changes, MODIP checks and approves the proposals. The new programme of studies is communicated to MENG/UOWM and the students (internet) prior to the start of each academic year.

EEAP has found with pleasure that there are exceptionally close links between staff (both academic and administrative) and students. The students that EEAP met confirmed that academics of all rank and administrators adopt an open-door policy and students have access to staff at all times. Students are able to seek help and discuss with staff problems related to teaching or course administration on a regular basis.

EEAP commends MENG/UOWM for the exceptionally close links between staff (both academic and administrative) and students due to the open-door policy established at MENG/UOWM.

The administrative services are functional, in spite of the small number of personnel and the physical separation, thanks to the dedication of personnel and to modern approaches and implementation of IT.

It was also important for EEAP to learn from the academic staff, and later to have it confirmed by the students, that there are a number of informal but highly effective QA measures, through the input of student representatives at MENG/UOWM meetings, regular student meetings with the chairman of MENG/UOWM and through the open-door policy of all staff, which ensures that most problems that arise are addressed swiftly and good practices are disseminated across the MENG/UOWM.

Panel Judgement

Principle 2: Design and Approval of Programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

The External Evaluation & Accreditation Panel agrees that this Programme leads to a Level 7 Qualification according to the National & European Qualifications Network (Integrated Master)	YES	NO*
	X	

Panel Recommendations

- **R2.1:** EEAP has been informed that the UOWM management is planning for investments across various areas, which also touch in new fields. The Panel considers that MENG/UOWM has the infrastructure and expertise to lead in the consolidation on a single campus; it is our strong recommendation to consider such consolidation to take place at the earliest and in close consultation with MENG/UOWM.
- **R2.2:** The need for longer periods than the usual 3 months has been emphasized by all involved increasing to 6 months.
- **R2.3:** The additional input from an Industrial Advisory Board would help promote the students' curriculum overall.
- **R2.4:** The progression of the students is an area that improvements are necessary. This situation creates obvious difficulties, both to the student's further development but also to the operation of MENG/UOWM. The reasons for this situation are mainly related to factors outside the influence of MENG/UOWM.
- **R2.5:** EEAP strongly recommends that the course prerequisites should be implemented especially in the transition from the 3rd to the 4th year of studies.

Principle 3: Student- centred Learning, Teaching and Assessment

INSTITUTIONS SHOULD ENSURE THAT THE UNDERGRADUATE PROGRAMMES ARE DELIVERED IN A WAY THAT ENCOURAGES STUDENTS TO TAKE AN ACTIVE ROLE IN CREATING THE LEARNING PROCESS. THE ASSESSMENT METHODS SHOULD REFLECT THIS APPROACH.

Student-centred learning and teaching plays an important role in stimulating students' motivation, self-reflection and engagement in the learning process. The above entail continuous consideration of the programme's delivery and the assessment of the related outcomes.

The student-centred learning and teaching process

- *respects and attends to the diversity of students and their needs, enabling flexible learning paths;*
- *considers and uses different modes of delivery, where appropriate;*
- *flexibly uses a variety of pedagogical methods;*
- *regularly evaluates and adjusts the modes of delivery and pedagogical methods aiming at improvement;*
- *regularly evaluates the quality and effectiveness of teaching, as documented especially through student surveys;*
- *reinforces the student's sense of autonomy, while ensuring adequate guidance and support from the teaching staff;*
- *promotes mutual respect in the student - teacher relationship;*
- *applies appropriate procedures for dealing with students' complaints.*

In addition :

- *the academic staff are familiar with the existing examination system and methods and are supported in developing their own skills in this field;*
- *the assessment criteria and methods are published in advance;*
- *the 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;*
- *student assessment is conducted by more than one examiner, where possible;*
- *the regulations for assessment take into account mitigating circumstances;*
- *assessment is consistent, fairly applied to all students and carried out in accordance with the stated procedures;*
- *a formal procedure for student appeals is in place.*

Study Programme Compliance

Based on the "Studies Guide" (Οδηγός Σπουδών), the discussions with students the MENG/UOWM faculty and its OMEA, the EEAP found clear evidence that the programme is definitely student-centred with the use of different teaching techniques, both in lectures and laboratory. MENG/UOWM respects and listens to the students' needs and concerns. The open-door policy of the teaching staff is very well appreciated by the students.

MENG/UOWM has appointed a faculty advisor to each student, with emphasis to first-year students. The teaching relies on contemporary methods with practical examples and experiments wherever possible. Relevant bibliographic support is easily found and accessible and direct contacts with the teaching staff is noted.

However, EEAP noticed a relatively small number of courses have an experimental component. In addition, the single course in automatic control is not enough and MENG/UOWM should consider extending the offer in this discipline. It was noticed also courses in machine learning and artificial intelligence are lacking. Regarding the design-orientation, project-oriented courses in mechatronics are lacking. This was also noted by the students.

The discussion with the students' representatives was very positive and provided useful information to the EEAP on the teaching and student-teacher interaction. The students are kept informed on the course content, laboratory project/work and the course evaluations. They are also encouraged to participate in all lectures and exercises. The small number of students in the elective courses was noted and the EEAP recommends reducing their number.

The participation on international design projects is very well appreciated by the students and the EEAP applauds the excellent results and efforts by the students and MENG/UOWM staff. It is well known that project-based teaching is well appreciated by the students and should be continued. The EEAP also recommends emphasizing projects-based teaching carried out by groups of students. This would allow the students to develop teamwork skills and promote further student-centred teaching and learning.

The discussions with the current and former students as well as the industrial representatives were also very useful. What emerged from these discussions was that while the programme offers a very strong disciplinary training, the importance for project participation and industry internships should be expanded.

Regarding the teaching evaluation, the EEAP finds that it is well done, although the student participation is at the low end. Thus, the Department and the teaching staff should continue to encourage the students to participate in the online evaluations.

EEAP also proposes to offer seminars per year in general areas from prominent individuals in industry and academia. That would give them a better idea what is to be expected in the work environment.

EEAP found that the teaching is sufficiently student-centred with an excellent student support system.

Panel judgement

Principle 3: Student- centred Learning, Teaching and Assessment	
Fully compliant	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

- **R3.1:** Increase opportunities for students to gain more hands-on experience via design projects, increased laboratory engagement, and assign to such activities a significant portion/percentage of the appropriate course final grade.
- **R3.2:** Increase students' awareness and promotion of existing opportunities so that more of them apply for and participate in ERASMUS and Internships.
- **R3.3:** Regular seminars (e.g., every month) on subjects concerning the research and industry problems related to the Department's mission would enhance the esprit-de-corps of the students, provide greater motivation for enhanced student learning, lead to potential student project and theses topics and relate students with laboratories and specific faculty members.
- **R3.4:** The EEAP strongly feels that the merging with the local technical school (TEI) can contribute significantly to the practical and engineering aspects of the curriculum, especially by expanding the laboratory and project-oriented courses as well as team projects.

Principle 4: Student Admission, Progression, Recognition and Certification

INSTITUTIONS SHOULD DEVELOP AND APPLY PUBLISHED REGULATIONS COVERING ALL ASPECTS AND PHASES OF STUDIES (ADMISSION, PROGRESSION, RECOGNITION AND CERTIFICATION).

Institutions and academic units need to put in place both processes and tools to collect, manage and act on information regarding student progression.

Procedures concerning the award and recognition of higher education degrees, the duration of studies, rules ensuring students progression, terms and conditions for student mobility should be based on the institutional study regulations. Appropriate recognition procedures rely on institutional practice for recognition of credits among various European academic departments and Institutions, in line with the principles of the Lisbon Recognition Convention.

Graduation represents the culmination of the students' study period. Students need to receive documentation explaining the qualification gained, including achieved learning outcomes and the context, level, content and status of the studies that were pursued and successfully completed (Diploma Supplement).

Study Programme Compliance

There are several tools to serve the smooth transition of freshmen in the academic environment. Initially both the central site of MENG/UOWM as well as the website and the study guide of MENG/UOWM contain plethora of information for the settlement of incoming students along with accurate guidelines for their first steps (including admission, registration, statements for courses) in the UOWM and the MENG/UOWM, while the administrative faculty is always supportive toward this direction to elaborate more involved questions/concerns by the incoming students through e-mail exchange and by telephone calls. In more detail, in the MENG/UOWM website there is a separate section with guidelines and announcements for the freshmen, while the study guide when is necessary provides individual information for the incoming students. In addition, every year during October, the Head of MENG/UOWM along with the academic advisor and the faculty of MENG/UOWM are organizing a special day to welcome the incoming students with a constructive presentation involving also an open Q&A session. Lastly, all MENG/UOWM members involved in the courses of the first semester are dedicating their first hour to explain and describe to freshmen the prospects and challenges of their new academic life.

The progression of students is monitored by their evaluation in courses. In every course apart from the final exam there are also several other ways, which are employed to better evaluate students' performance including homework assignments (individual or in teams), progress test, final year exams and laboratory coursework. In addition, in the e-class and MODIP platforms there are several tools and statistical data to aid academic staff to monitor the progress of students. Moreover, recently, the general assembly of MENG/UOWM during the discussion to reform the curriculum guide, decided to add a condition in the number of successful courses to

allow students to pass from the 1st cycle to the 2nd cycle of studies. This is an indirect approach to monitor the progression of students and force them (in a good manner) to be devoted and dedicated to their academic studies.

The mobility of students is strongly encouraged by the administration and the academic staff of MENG/UOWM through the ERASMUS programme and internships through ESPA and IASTE. Every year the department is organizing separate presentations to present the aforementioned programmes to students. For each programme there are several rules and conditions for students willing to apply that are mostly related with their performance and progress. In addition, the students willing to elaborate their diploma thesis in industry or other national/international academic/research institutions are supported by the administration of MENG/UOWM.

ECTS are applied in all courses offered through the current curriculum of the department. In the MODIP platform, there is a detailed and justified description of the methodology to calculate the ECTS for each course. In addition, there is a strong suggestion by the administration of MENG/UOWM to the academic staff to present to the students the distribution of workload in their courses at the beginning of each semester. Along with their diploma, all students, upon graduation, also receive a fully detailed diploma supplement.

In the recent reform of the curriculum guide there are clear conditions and terms for the assignment and elaboration of the diploma thesis, which are clearly presented in the corresponding guide and can be downloaded from the website of MENG/UOWM. For example, a diploma thesis can be assigned to students with less than 9 uncompleted courses and the subject of the diploma thesis should apply to the selected specialization studies without excluding inter-specialization study subjects. In the corresponding guide there is also information regarding the official format and structure of the diploma thesis, while all these are uploaded to the e-class platform.

Regarding the training programme, there is a network of private companies and public bodies with long term cooperation with the department, including Public Power Corporation, Kleeman, DIADYMA, ELINOIL and BETA CAE. This network is enriched each year by the alumni association, the UOWM career office and by the cooperation with companies involved in research projects with the academic staff of MENG/UOWM. The main tool for internships is through the corresponding ESPA programme, but bilateral agreements with private/public organizations are also supported by the administration of MENG/UOWM.

The practical training of the students is a valuable part of the curriculum guide and is referred in the Diploma supplement. The main aim of the practical training for the students is to provide them with the opportunity to gather valuable experience and skills. The whole practical training programme is facilitated through presentations from the Programme coordinator, including presentations of students who have already participated in the Programme, and is supported by an online platform (ATLAS) where all companies/partners of the department are registered so as to be selected by students.

Panel Judgement

Principle 4: Student Admission, Progression, Recognition and Certification	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

- **R4.1:** Due to the transition of the Energy industry from carbon to clean energy sources, the Department should upgrade and strengthen its position, by participating in the projects already running and the projects due to start, that concern the Energy transition of Western Macedonia and consequently of Greece, in cleaner energy sources. Through this, MENG/UOWM could upgrade and enrich its training programme, providing the opportunity for the students to participate actively in energy related projects.

Principle 5: Teaching Staff

INSTITUTIONS SHOULD ASSURE THEMSELVES OF THE QUALIFICATIONS AND COMPETENCE OF THE TEACHING STAFF. THEY SHOULD APPLY FAIR AND TRANSPARENT PROCESSES FOR THE RECRUITMENT AND DEVELOPMENT OF THE TEACHING STAFF.

The Institutions and their academic units have a major responsibility as to the standard of their teaching staff providing them with a supportive environment that promotes the advancement of their scientific work. In particular, the academic unit should:

- *set up and follow clear, transparent and fair processes for the recruitment of properly qualified staff and offer them conditions of employment that recognize the importance of teaching and research;*
- *offer opportunities and promote the professional development of the teaching staff;*
- *encourage scholarly activity to strengthen the link between education and research;*
- *encourage innovation in teaching methods and the use of new technologies;*
- *promote the increase of the volume and quality of the research output within the academic unit;*
- *follow quality assurance processes for all staff members (with respect to attendance requirements, performance, self-assessment, training etc.);*
- *develop policies to attract highly qualified academic staff.*

Study Programme Compliance

MENG/UOWM follows a rigorous procedure to recruit highly qualified teaching staff following the national standards and available resources. It emphasizes the importance of teaching and research in the fields and domains defined by MENG/UOWM and the UOWM, underlines to all its members the importance of producing scholarly work and linking research and teaching.

The professional development is supported by MENG/UOWM and involves promotion to higher academic ranks by rigorous review procedures and following applicable laws and regulations and; via research collaborations with local and international industry; acquiring research grants from the public and private sectors; participating in EU programmes as well as teaching and interacting with leading universities across the world.

The teaching workload of the academic staff follows existing applicable laws and regulations across the country. However, the workload is on the high end as compared to very good European universities. The high workload may inhibit mobility and reduces the efforts for the development of projects and the research output. Despite the high workloads, several academic staff members produce excellent works in teaching and research.

There is substantial evidence of important linkage of research and teaching, especially in energy related problems. This is manifested by the use of research laboratories as teaching laboratories. Such a link has several benefits in terms of student motivation and selection of important topics for projects theses. In addition to enhancing the students' educational experience to greater depth, it contributes to the research mission of the school. Such an activity creates a very positive teaching environment with all actors involved, i.e., teaching staff, postdoctoral researchers, doctoral and other postgraduate students as well as pre-diploma

students work in a common environment. MENG/UOWM, however, should increase the use of research laboratories and establish project-based courses and team projects.

MENG/UOWM regularly evaluates the courses and teaching staff through end-of-term in-class surveys using an online system. However, due to a smaller student participation, the evaluations are not representative and MENG/UOWM should look for solutions to improve participation. The evaluation is transmitted to the OMEA which has the overview of the entire programme and its quality assurance and assures confidentiality as well as suitable constructive feedback for continued improvement of the programme and teaching staff.

Panel Judgement

Principle 5: Teaching Staff	
Fully compliant	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

- **R5.1:** While the teaching staff provide teaching and research output of high quality, it is important that MENG/UOWM introduces additional project-based courses and team projects so that the students obtain more hand-on experience. The EEAP believes that the consolidation of MENG/UOWM on a single campus will provide such opportunities.
- **R5.2:** MENG/UOWM should define a clear and transparent multi-annual strategy on research-teaching and technology development that would define the academic and technical staff needs in a transparent and sustainable way.
- **R5.3:** MENG/UOWM and UOWM should establish clear policies to promote hiring female academic staff.
- **R5.4:** MENG/UOWM should look for solutions to improve the students' participation in their evaluation of the programme and coursework and projects.

Principle 6: Learning Resources and Student Support

INSTITUTIONS SHOULD HAVE ADEQUATE FUNDING TO COVER TEACHING AND LEARNING NEEDS. THEY SHOULD –ON THE ONE HAND- PROVIDE SATISFACTORY INFRASTRUCTURE AND SERVICES FOR LEARNING AND STUDENT SUPPORT AND–ON THE OTHER HAND- FACILITATE DIRECT ACCESS TO THEM BY ESTABLISHING INTERNAL RULES TO THIS END (E.G. LECTURE ROOMS, LABORATORIES, LIBRARIES, NETWORKS, BOARDING, CAREER AND SOCIAL POLICY SERVICES ETC.).

Institutions and their academic units must have sufficient funding and means to support learning and academic activity in general, so that they can offer to students the best possible level of studies. The above means could include facilities such as libraries, study rooms, educational and scientific equipment, information and communications services, support or counselling services.

When allocating the available resources, the needs of all students must be taken into consideration (e.g. whether they are full-time or part-time students, employed or international students, students with disabilities) and the shift towards student-centred learning and the adoption of flexible modes of learning and teaching. Support activities and facilities may be organised in various ways, depending on the institutional context. However, the internal quality assurance ensures that all resources are appropriate, adequate, and accessible, and that students are informed about the services available to them.

In delivering support services the role of support and administrative staff is crucial and therefore they need to be qualified and have opportunities to develop their competences.

Study Programme Compliance

Considering the current financial framework, MENG/UOWM ensures adequate funding and tools to support learning. These instruments include the following: a) fully equipped computer lab with 30 PCs, b) wireless Wi-Fi access (eduroam), c) up-to-date scientific, technical and educational software (e.g. CAD, structural, energy and systems analysis software, CFD), d) study room equipped with computers (10), printer, photocopier and projection media, e) classrooms equipped with modern audio-visual equipment and dedicated PCs, f) Open e-class - Asynchronous Distance Learning Platform, g) library with access to electronic resources and repositories, h) scholarships rewarding effort and excellence (until 2018-2019 academic year), i) organization of educational visits in Greece and abroad linked to the learning outcomes of individual modules and Programme of study, j) support services (e.g. career office, internship office, innovation and entrepreneurship unit, student welfare unit).

It is worth noting the following: a) Open e-class - Asynchronous Distance Learning Platform, which constitutes an integrated e-Courses management system available to the students of MENG/UOWM. Access to the service is done using a simple web browser without the requirement of specialized technical knowledge, b) the Innovation and Entrepreneurship Unit, which aims to encourage business and innovation, the preparation and education of young people for employment in small businesses and the creation of sole proprietorships (self-

employment), and the creation of educational programmes that cultivate the innovative business thinking and action, and c) in the near future, the internal funding of MENG/UOWM by the UOWM will be linked to their research performance providing strong motives for improving continuously their Key Performance Indicators (KPIs).

Panel Judgement

Principle 6: Learning Resources and Student Support	
Fully compliant	x
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

- **R6.1:** EEAP endorses the link of the MENG/UOWM funding to research performance that provides strong motives for improving continuously their Key Performance Indicators (KPIs).

Principle 7: Information Management

INSTITUTIONS BEAR FULL RESPONSIBILITY FOR COLLECTING, ANALYSING AND USING INFORMATION, AIMED AT THE EFFICIENT MANAGEMENT OF UNDERGRADUATE PROGRAMMES OF STUDY AND RELATED ACTIVITIES, IN AN INTEGRATED, EFFECTIVE AND EASILY ACCESSIBLE WAY.

Institutions are expected to establish and operate an information system for the management and monitoring of data concerning students, teaching staff, course structure and organisation, teaching and provision of services to students as well as to the academic community.

Reliable data is essential for accurate information and for decision making, as well as for identifying areas of smooth operation and areas for improvement. Effective procedures for collecting and analysing information on study programmes and other activities feed data into the internal system of quality assurance.

The information gathered depends, to some extent, on the type and mission of the Institution. The following are of interest:

- *key performance indicators*
- *student population profile*
- *student progression, success and drop-out rates*
- *student satisfaction with their programme(s)*
- *availability of learning resources and student support*
- *career paths of graduates*

A number of methods may be used for collecting information. It is important that students and staff are involved in providing and analyzing information and planning follow-up activities.

Study Programme Compliance

Through the academic advisor of MENG/UOWM, several data are collected regarding the first-year students (place of origin, social characteristics, reasons for choosing MENG/UOWM, etc.).

The information system of the MENG/UOWM administrators contains information regarding the student body and their progress (years of study, course grades, number of students per direction of studies, place of origin, performance in the national exams, admission ranking order, selection order of the department, etc.). On a regular basis, statistical processing of students' progress data is performed, and the results are compared with corresponding data of similar departments.

The teaching methods are fully recorded in the course outlines which are included in the information system of MODIP.

The employability and career path of the graduates is monitored through the Career Office and Alumni of UOWM. The Career Office, in collaboration with MENG/UOWM, has recently conducted a survey regarding the MENG/UOWM graduates and their employment characteristics. From this study, interesting conclusions emerged regarding the areas of activity

of MENG/UOWM graduates, their views on MENG/UOWM curriculum, their employment type and so on. The information system e-class is also used by the Secretariat Office for data access and completion.

The same information system e-class is used by MODIP, both for the course outlines and the professors' scientific activities, as well as for the online completion of the evaluation questionnaires by students and academic staff regarding the educational and administrative procedures.

The online completion of questionnaires directly through the website of the UOWM (e.g., the survey regarding MENG/UOWM graduates through the website of the Career office).

The information system used by the academic staff and students for the course activities (e-class) for the collection of data related to specific courses and activities.

At the end of each semester, the students evaluate the educational process, via online questionnaires, expressing their degree of satisfaction on the educational activities of MENG/UOWM. The administrative services are evaluated on an annual basis by the academic staff of MENG/UOWM.

At the end of each evaluation period, the completed questionnaires are collected and analysed by OMEA of the department. The summary results of the analysis and the information obtained are communicated by the Head of MENG/UOWM to the academic staff and student representatives during the General Assembly of MENG/UOWM. Whenever there are specific complaints by the students, the Head of MENG/UOWM proceeds to private meetings with the academic staff of the respective courses and the necessary measures are taken to deal with the problems that may arise. In addition, a citation of excellence is awarded to the academic staff who achieve the highest evaluation grade.

Finally, each academic staff studies the evaluation questionnaires of their courses as well as the students' comments in detail, discusses them with their students and use the feedback they receive from the students through the evaluation process to improve the quality of the provided studies.

The academic unit analyses and evaluates data related to the availability and accessibility of resources through the analysis of the students' responses to the respective questions included in the evaluation questionnaires, where the students' opinion on the availability and accessibility of equipment and information technologies is submitted.

MODIP evaluation system provides the option of exporting aggregate tables and graphs and facilitates the overall and comparative presentation of the results between the several courses, academic staff, years of study, evaluation periods. In addition, OMEA further processes the collected data in order to obtain a better picture and to facilitate the monitoring of the performance indicators of the department. The relevant results are presented to the General

Assembly of MENG/UOWM after appropriate elaboration in order to facilitate their review and their comparative evaluation by all members.

EEAP finds the MENG/UOWM Information Management system and its operation to be very detailed and supported by a state-of-the-art IT service.

Panel Judgement

Principle 7: Information Management	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

- **R7.1:** The aggregate evaluation results should be communicated to the students in a more systematic way, e.g., through a meeting with them and through MENG/UOWM website.

Principle 8: Public Information

INSTITUTIONS SHOULD PUBLISH INFORMATION ABOUT THEIR TEACHING AND ACADEMIC ACTIVITIES WHICH IS CLEAR, ACCURATE, OBJECTIVE, UP-TO-DATE AND READILY ACCESSIBLE.

Information on Institution's activities is useful for prospective and current students, graduates, other stakeholders and the public.

Therefore, institutions and their academic units provide information about their activities, including the programmes they offer, the intended learning outcomes, the qualifications awarded, the teaching, learning and assessment procedures used, the pass rates and the learning opportunities available to their students, as well as graduate employment information.

Study Programme Compliance

All information related to the academic process and the degree awarded (structure of the study programme, content of the courses, mode of attendance etc.) are presented in detail in the Study Guide as well as on the website of MENG/UOWM. Detailed information regarding each course along with the respective assessment criteria of the students, are presented on the website of each course in the e-class platform. All academic staff's CVs as well as their scientific activities are available on the website of MENG/UOWM.

All course outlines of the Programme are complete and available on-line through the information system of MODIP and they are also included in the Study Guide of MENG/UOWM. The relevant information of each course is also included in the course website in the e-class platform. The QA policy of MENG/UOWM is available on-line on the website of the department.

MENG/UOWM website has been recently redesigned in order to make its content easily accessible by visitors. The content of the website is constantly monitored by the person in charge of the website (but also by the Head of MENG/UOWM and all the academic and other staff members) to ensure that it is always up-to-date and accurate.

MENG/UOWM website includes detailed information with respect to the department and the studies offered, but also with respect to the daily operation of MENG/UOWM so that all students are well-informed about the functions of the department and the recent developments.

The addition of MENG/UOWM social media pages, to the official website of MENG/UOWM, as well as constant updating, will assist the visibility and contribution to education and technology of MENG/UOWM.

EEAP applauds the Public Information campaign and efforts of MENG/UOWM.

Panel Judgement

Principle 8: Public Information	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

- **R8.1:** EEAP has EEAP proposes the enhanced use of the Public Information and social media to promote MENG/UOWM contribution and increase its visibility to potential students of MENG/UOWM and society at large.

Principle 9: On-going Monitoring and Periodic Internal Review of Programmes

INSTITUTIONS SHOULD HAVE IN PLACE AN INTERNAL QUALITY ASSURANCE SYSTEM FOR THE AUDIT AND ANNUAL INTERNAL REVIEW OF THEIR PROGRAMMES, SO AS TO ACHIEVE THE OBJECTIVES SET FOR THEM, THROUGH MONITORING AND AMENDMENTS, WITH A VIEW TO CONTINUOUS IMPROVEMENT. ANY ACTIONS TAKEN IN THE ABOVE CONTEXT SHOULD BE COMMUNICATED TO ALL PARTIES CONCERNED.

Regular monitoring, review and revision of study programmes aim to maintain the level of educational provision and to create a supportive and effective learning environment for students.

The above comprise the evaluation of:

- *the content of the programme in the light of the latest research in the given discipline, thus ensuring that the programme is up to date;*
- *the changing needs of society;*
- *the students' workload, progression and completion;*
- *the effectiveness of the procedures for the assessment of students;*
- *the students' expectations, needs and satisfaction in relation to the programme;*
- *the learning environment, support services and their fitness for purpose for the programme*

Programmes are reviewed and revised regularly involving students and other stakeholders. The information collected is analysed and the programme is adapted to ensure that it is up-to-date. Revised programme specifications are published.

Study Programme Compliance

The internal evaluation of MENG/UOWM Undergraduate Programme takes place once year. The report is presented in the MENG/UOWM Assembly - in the middle of the spring semester, when the distribution of the courses of the next academic year takes place. In addition, MENG/UOWM conducts internal meetings with the faculty members whose decisions are ratified in the MENG/UOWM Assembly. In the Assembly, the teaching staff analyse the material of the courses to be covered, as well as the specific skills that students are expected to have developed by end of the courses, which they include in the learning and teaching objectives.

In addition, they report the level of knowledge of pre-requisite courses, so that there are neither learning gaps nor substantial overlaps. Finally, the teaching staff presents the changes they are going to implement in the course material and the reasoning behind their approach. All the above information is recorded in detail in course inventories. The remaining teaching staff meetings revolve around issues such as material coverage, degree of participation and response of students in the courses against the learning concepts or procedures. Good teaching practices are also disseminated during these meetings together with proposals for changes and improvements. During these meetings, the teaching staff conduct the comprehensive review of the Programme of Studies to make certain its relevance to current developments and skills required in the job market. There is a continuous effort to integrate labs in selected courses.

It should be noted that the flexibility to modify the Undergraduate Programme is limited by the small number of staff members. Nevertheless, in recent years (2016-2017 to 2018-2019), there have been a number of targeted changes and improvements driven by a number of staff members, the funding available and the recruitment of part-time teachers. Some examples of these changes/improvements were discussed during the meetings with EEAP coupled with the information available in the documentation. There is a plan of a more comprehensive revision of the Undergraduate Programme enabled by the integration of colleagues from the former TEI of Western Macedonia, covering a number of commendable changes that will certainly enhance teaching quality, learning provision and student experience.

Panel Judgement

Principle 9: On-going Monitoring and Periodic Internal Review of Programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

- **R9.1:** EEAP recommends an appropriate revision of the Undergraduate Programme to enable the enhancement of teaching and project-based teaching, learning provision and student experience.

Principle 10: Regular External Evaluation of Undergraduate Programmes

PROGRAMMES SHOULD REGULARLY UNDERGO EVALUATION BY COMMITTEES OF EXTERNAL EXPERTS SET BY HAHE, AIMING AT ACCREDITATION. THE TERM OF VALIDITY OF THE ACCREDITATION IS DETERMINED BY HAHE.

HAHE is responsible for administrating the programme accreditation process which is realised as an external evaluation procedure, and implemented by a committee of independent experts. HAHE grants accreditation of programmes, with a specific term of validity, following to which revision is required. The accreditation of the quality of the programmes acts as a means of verification of the compliance of the programme with the template's requirements, and as a catalyst for improvement, while opening new perspectives towards the international standing of the awarded degrees.

Both academic units and institutions participate in the regular external quality assurance process, while respecting the requirements of the legislative framework in which they operate.

The quality assurance, in this case the accreditation, is an on-going process that does not end with the external feedback, or report or its follow-up process within the Institution. Therefore, Institutions and their academic units ensure that the progress made since the last external quality assurance activity is taken into consideration when preparing for the next one.

Study Programme Compliance

The programmes of MENG/UOWM – undergraduate, graduate, and research – were evaluated by an external committee (EEC) in 2013. The evaluation offered several Conclusions and Recommendations and MENG/UOWM has provided the 2021 EEAP with a complete self-assessment that describes the level of progress achieved by MENG/UOWM toward achieving the proposed recommendations. During the 3-year period following the 2013 external evaluation – 2013-2016, the department estimates that an 80% of the recommendations have been substantially addressed – some completed, while good and ongoing progress has been achieved in others.

The EEAP appreciates the level of effort expended to achieve such progress, given the workload carried by both the administration and academic and other staff of MENG/UOWM, as well as the constraints placed by existing laws and regulations and by limited resources and funding. In particular the Panel applauds the efforts and results in enhancing the design component of the curriculum (construction and materials engineering).

Taking into account all the work done so far, the EEAP considers it important to pursue to their completion at the earliest possible time. In particular, work on the recommendation made by the EEC regarding an explicit research strategy for the next 5 to 10 years 'which identifies a small number of coherent specific research themes which will act as the Department's research focus. The plan might include the actions to be taken to secure the necessary resources, a faculty appointment strategy to ensure that each theme has sufficient number of faculty and resilience when faculty leaves.

There is very good evidence that MENG/UOWM is well aware of the importance and value added by the external accreditation process and cooperated fully with the EEAP.

Panel Judgement

Principle 10: Regular External Evaluation of Undergraduate Programmes	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

None.

PART C: CONCLUSIONS

I. Features of Good Practice

- The QA process is in place and is properly functioning.
- Involvement of undergraduate students in hands-on projects and research is successful.
- The IT platform is very efficient and comprehensive.
- Support is in place to students interested in practical training and internships.
- Links with the private and public sectors are well established, and further encouraged and promoted.
- EEAP endorses the link of the MENG/UOWM funding to research performance that provides strong motives for improving continuously their Key Performance Indicators (KPIs).
- There is a very positive atmosphere within MENG/UOWM.

II. Areas of Weakness

- A large number of incoming students leave MENG/UOWM for other similar departments in Greece.
- There are not enough project-based learning opportunities.
- The lack of a concentrated campus possesses difficulties in organising efficiently courses and laboratory exercises. EEAP expects that the consolidation of MENG/UOWM in its new buildings and installations will eliminate several organisational issues regarding project-based teaching and team projects.

III. Recommendations for Follow-up Actions

- Define an explicit research strategy for the next 5 to 10 years that will act as the MENG/UOWM research focus.
- Establish an external advisory board with industry and community partners.
- Every effort should be undertaken to increase the number of female academic staff in MENG/UOWM.
- Encourage students to take advantage of the ERASMUS mobility programme.
- Introduce more project-based learning opportunities for students, with design projects and increased laboratory engagement.
- Promote the widening participation and outreach activities that enable and facilitate societal impacts, for example, visiting schools in the region and professional societies and associations to promote awareness of the current societal issues and STEM related opportunities.
- Maintain the courses offered in basic sciences and introduce courses in machine learning and artificial intelligence.

- There is a need for longer periods than the usual 3 months for an industrial internship.
- The progression of the students is an area that improvements are necessary.
- EEAP strongly recommends that the course prerequisites should be implemented especially in the transition from the 3rd to the 4th year of studies.
- The Department should promote and implement procedures for larger involvement of the students in the course evaluation.
- Introduce a series of seminars to be delivered from external lecturers / industry representatives on the profession of a mechanical engineer and the latest developments.

In summary, EEAP recommends MENG/UOWM to nurture and promote education and research programmes and projects related to the Energy Sector that address today's economic and environmental issues.

IV. Summary & Overall Assessment

The Principles where full compliance has been achieved are: **1, 2, 4, 6, 7, 8, 9, and 10.**

The Principles where substantial compliance has been achieved are: **3 and 5.**

The Principles where partial compliance has been achieved are: **None.**

The Principles where failure of compliance was identified are: **None.**

Overall Judgement	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

The External Evaluation & Accreditation Panel agrees that this Programme leads to a Level 7 Qualification according to the National & European Qualifications Network (Integrated Master)	YES	NO
	X	

The members of the External Evaluation & Accreditation Panel

Name and Surname

Signature

- 1. Prof. George Aggidis (Chair)**
Lancaster University, United Kingdom
- 2. Prof. Ioannis Botsis**
École Polytechnique Fédérale de Lausanne, Switzerland
- 3. Prof. Konstantinos Kontis**
University of Glasgow, United Kingdom
- 4. Mr. Leonidas-Gerasimos Travlos**
Member of the Technical Chamber of Greece, Greece