



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

**Materials Science and Engineering
Institution: University of Ioannina
Date: 19 December 2020**

Report of the Panel appointed by the HAHE to undertake the review of the Undergraduate Study Programme (Integrated Master) of **Materials Science and Engineering** of the **University of Ioannina** for the purposes of granting accreditation

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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 **Materials Science and Engineering** of the **University of Ioannina** comprised the following four (4) members, drawn from the HAHE Register, in accordance with Laws 4009/2011 & 4653/2020:

- 1. Professor Georgia Papaefthymiou (Chair)**
Villanova University, USA
- 2. Professor George Malliaras**
University of Cambridge, United Kingdom
- 3. Professor Vasileios Koutsos**
The University of Edinburgh, United Kingdom
- 4. Dr. Athanasios Katsouras**
Technical Chamber of Greece

II. Review Procedure and Documentation

Extensive documentation was sent to the External Evaluation & Accreditation Panel (EEAP) on 30/11/2020. The complete list of documents can be found in the HAHE Cloud link: <https://docs.ethaae.gr/s/ZnTYZi4Gg7XBf54>. These provided important guidelines on the evaluation process and detailed information on the educational and research components of the Department of Materials Science & Engineering (DMSE). In particular the documents European Qualifications Framework, ODIGOS PISTOPOIISIS, Standards for Quality Accreditation Programs, Guidelines for the Accreditation Panel, P13 Mapping Grid, P14 Template for the Accreditation Report, Quality Indicators for DMSE for the years 2015 – 2019, The 2011 External Evaluation Report, the departmental Proposal for Academic Accreditation of Undergraduate Studies, the Course Curriculum, Regulations on the Diploma Thesis, the Practical Training Internship, the ERASMUS programs, Questionnaires for course and faculty evaluation by students, Questionnaire for the graduating students in the 2017-2018 academic year and annual internal evaluations with recommendations by EDIP were noted.

These documents give a complete and transparent picture of the department, its vision, mission and accomplishments. The members of EEAP had ample time to study all provided documentation in preparation for the formal review, virtual site visit and evaluation of the department on behalf of HAHE for the purpose of accreditation.

On 7/12/2020 the EEAP attended a presentation by HAHE Director General Dr. Christina Besta on the purpose and process of Accreditation of Undergraduate Programs.

On 14/12/2020 the EEAP met privately to discuss the documents and to distribute the workload among its members for drafting the Accreditation Report.

The formal site visit took place over the following two days. The Panel was warmly welcomed by Departmental, University and Civic representatives. Meetings were well organized and efficiently run, allowing plenty of time for reflection, discussion and inquiry. The Panel was allotted several time slots for private debriefing at the end and in-between teleconferences and presentations. The structure and content of the presentations are outlined below.

On 15/12/2020 the EEAP participated in a teleconference with the Vice-Rector/President of MODIP, Prof. Nikolopoulos and the head of the department, Prof. Avgeropoulos, OMEA members Profs Barkoula, Agathopoulos and Lidorikis, MODIP members Profs Tsinas (Dept. of Agriculture) and Makis (Dept. of Medicine), and staff Ms. Alexoudi, Tagkareli and Griva.

A general introduction to the University of Ioannina and DMSE was given. The history, academic profile, internal controls policy and procedures, an overview of the undergraduate and graduate programs, human resources and building infrastructure, public and competitive funding on ongoing research activities were presented. Learning outcomes and the constantly evolving curriculum to meet recent developments in the field, links between teaching and research, self-centred learning and other pedagogical processes were also presented. The presentations were followed by questions & answers periods. The head of the department, Prof. Avgeropoulos, and the members of OMEA responded candidly to our questions and requests, answering in detail based on data. Their power point presentations were excellent, information presented was later confirmed by interviews with students, graduates and external stakeholders.

Additional teleconferences with twelve (12) members of the teaching staff and twelve (12) currently enrolled students followed. In the former, the Panel had the opportunity to discuss professional development opportunities for the teaching staff and their involvement in applied research projects directly related to the Undergraduate Program. In the latter, the Panel had an open and frank conversation with students about their undergraduate experience in the program.

On 16/12/2020 an on-line tour of classrooms, lecture halls, libraries laboratories, and other facilities was presented. The head of the department, laboratory directors and administrative staff members were present. Facilities, equipment and learning resources were discussed. This was followed by a teleconference with eleven (11) graduates of the department holding leadership positions in academic, governmental and industrial posts in Greece and Europe (Belgium, Norway, UK and Germany). Most had continued their education to earn doctoral degrees after graduation. They discussed their undergraduate experience in the department. They all credited the department for their success and quick advancement in their chosen career paths.

The next teleconference was with employers, social partners, and other external stakeholders. The regional governor of Epirus, Mr. A. Kahrimanis could not attend and was substituted by the sub-regional governor Mr Od. Potsis, the president of the Technical Chamber of Greece, Mr. G. Stasinou and presidents/managers of six (6) companies took part with discussions on their relations with the department. The companies host DMSE students for practical training internships in industry, which often lead to offers for permanent employment. All social partners showed enthusiastic support for the department and its long-term vision.

The site visit closed with additional conferences with representatives of OMEA and MODIP for final clarifications, questions & answers.

On 17, 18 and 19/12, the EEAP met privately on drafting the Accreditation Report.

III. Study Programme Profile

The Panel reviewed the accreditation proposal submitted by the department and found it complete including all crucial information. The program corresponds to level 7 according to European standards, it is completed in 5 years with mandatory Diploma Thesis, requires 300 ECTS and dispenses the “Integrated Masters” degree.

The undergraduate program (UP) offers 102 courses with 65 being required for graduation: **49** compulsory courses (39 Lectures, 10 Lab courses) – 222 ECTS (162 Lectures + 60 Lab), **51** elective courses (14 are required for graduation) – 42 ECTS, **Diploma thesis (I & II)** – compulsory – 36 ECTS –Internship program – optional – additional 2 ECTS .The UP courses are categorized as: General Background, e.g., mathematics, chemical thermodynamics, etc. Special Background, e.g., ceramic materials, physical metallurgy I, etc. Specialized Knowledge e.g., surface science and thin film technology, etc. carrying 38 % ECTS, 36 % ECTS, and 26 % ECTS, respectively. The curriculum also includes courses on computational modelling of novel materials. The Panel was also impressed that the department offers two (2) courses in the English language and scientific terminology associated with MS&E in English.

The academic merit of the UP is superb. It is a very dynamic, evolving and transformative program of studies. It is most impressive that the program has achieved excellence in a rather short period of time (established in 1999 as Materials Science and Technology and reclassified as Materials Science and Engineering in 2009). This is due equally to the prominence of materials science today in the scientific and technological spheres and the dedication and commitment of its faculty. The faculty has developed research activities in many hot areas of advanced quantum- and nano-materials, which promise to revolutionize technology and medicine in the 21st century with great societal impact. The presence of such advanced research, which has attracted significant competitive funding, affords an incalculable benefit to the UP. Students are exposed to first-rate research and experimental instrumentation for synthesis and characterization of novel materials in their undergraduate career.

The pre-eminence of modern materials by design in Science & Technology today has not yet been properly recognized by Greek authorities dispensing professional rights. This presents a problem for the graduates, who are highly qualified and many successfully seek employment abroad. Currently being recognized in Greece as a sub-specialty of Chemical Engineering, MS&E should be recognized as an independent Engineering field.

The success of the graduates is particularly impressive given the high student/faculty ratio and the relatively low base score of accepted students. A broader awareness of the field and granting of professional rights will attract students of even better academic credentials to the department. Educating our student body in materials science is imperative, as it will have a positive impact on the Greek economy, entrepreneurship and innovation.

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

Based on the Accreditation Proposal, DMSE has the vision to be at the cutting edge of basic and applied research and to provide students with modern high-quality education in the field of Materials Science & Engineering. It is the only Engineering Department dealing exclusively with Materials Science in Greece with partially recognized professional rights since the graduates are accepted by the Technical Chamber of Greece (TCG) within the Chemical Engineering specialty since 2017. The study program has a 5-year duration, which allows the students to be introduced in new technologies and applications related to Materials Science & Engineering. In particular, during the duration of the diploma thesis (in both the 9th and 10th semester) the students become specialized in the scientific area of their interest and develop a deep appreciation for the process of scientific research. It should be noted that the preference of the topic of the

diploma thesis is the students' choice, since they decide which faculty member will be their supervisor.

Two major milestones should be mentioned concerning advancement of the Department's graduates within the TCG:

- 05/2017: Enrolment of Graduates (after successful participation in examination either in their Diploma Thesis or 5 specific compulsory courses) to the TCG under the basic specialty of Chemical Engineers – Materials subspecialty.
- 02/2018: Initial Decision of TCG concerning the professional rights of Materials Science Engineers which are a part of the Chemical Engineers specialty.

DMSE through the study program is trying to achieve academic excellence, to provide high quality theoretical and applied education, training, and experience, as well as to enhance students' innate abilities, skills, and thinking processes in addition to promoting their technological skills. The Department is committed to complying with the requirements and to continuously improve the efficiency of quality management procedures. More specifically, DMSE is committed to implementing quality procedures that ensure:

1. Continuous improvement of the study program in order to achieve learning outcomes within the European and national Higher Education Qualifications Framework.
2. Appropriateness of the structure and organization of the curriculum and provision of high-quality education for a complete learning experience.
3. In addition to providing scientific knowledge, the aim to cultivate skills that help the students in their transition to the labour market especially during the last year of studies is evident.
4. Improving the performance and satisfaction of students / graduates through targeted actions. A key role on this point is played by the Studies Advisor as well as the utilization of the evaluation results of the study program by the students and graduates.
5. Production of high-level research of international impact and connection with the educational process. A key role at the level of the study program is played by the elaboration of the Diploma Thesis, which aims, among other things, at the education of students in ensuring compliance with ethical rules in research, its products and publications.
6. Strengthening the extroversion and the recognizability of the Department - connection of the educational process with the labour market, by supporting the participation of the members of the Department in mobility programs, internship, networking and publicity actions.
7. Upgrading the infrastructure, support, administrative and electronic procedures of the Department.

Through OMEA the Department is committed to the continuous improvement of the quality policy that supports the academic profile, orientation of the curriculum, students and Faculty. Together with the University MODIP compiles and completes the students' evaluations. The results of all evaluations are discussed in detail in the General Assembly of the Department, and this allows the definition of actions and priorities in order to achieve the objectives of the Department.

The general principles of the study program adhere to international standards. They are systematically reviewed on the basis of the evaluation and inputs by - student suggestions, - Study program Committee, - External evaluations, - Faculty and Teaching staff, - Feedback from

alumni and external stakeholders. These are proposed to the Study Program Committee, which then brings them for approval to the General Assembly. Graduates of the Department have the background to study, research, understand and apply fundamental concepts and modern methodologies for the development, design and characterization of new materials. Thus, they can be employed in industry, the private sector and in senior positions as teaching staff.

The Department revises its quality goals regarding the study program annually (no later than the end of May). Revisions are implemented in the next academic year.

In defining the Department's targets, its vision and mission were taken into account as well as the data and indicators as evaluated by (OMEA)- (MODIP). The means of achieving the above strategic goals include:

1. The continuous internal evaluation and improvement of the quality and efficiency of teaching within the Department.
2. The continuous effort to link teaching with research.
3. The acquisition of skills and qualifications of DMSE graduates in view of competitive insertion into the labour market.
4. The continuous strengthening of the network of support services for the students.

Panel Judgement

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

Panel Recommendations

- The DMSE study program committee should always be ready to suggest new courses based on the new technological advancement in Materials Science & Engineering and suggest these courses to the General Assembly to be included within the study program according to the teaching needs.
- The MODIP of the University and the OMEA of the Department should encourage the students to complete the evaluation forms concerning the courses of the study program and increase the low 25-30% involvement in digital evaluations as mentioned by the Vice-Rector and the Head of the MODIP in a value at least higher than 50%. In that manner a more comprehensive evaluation of the course outline and the teaching staff will be made.

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

The vision of the Department is to provide its students with the most updated, state of the art and high-quality education in all fields of Materials Science & Engineering. The aim is that the graduate be able to confront all anticipated issues concerning socioeconomic needs in the public and private sector through the knowledge gained from the intense but very well targeted undergraduate studies program.

The specific study program is based on international standards aiming to offer both theoretical and practical knowledge through three different types of courses: general background, special background and specialized knowledge, respectively. In addition, a very well-established diploma thesis cycle in the 5th year is evident, which is compulsory for graduation. The student must attend 49 compulsory courses (39 lectures and 10 laboratories), 14 elective courses (out of the total 51 offered) and the compulsory diploma thesis on the fifth year. All these courses together with the thesis lead to a total of 300 ECTS (30 ECTS/semester for the 10 semesters in total). Therefore, it is evident that the program is consistent with the European Credit Transfer System (ECTS). The individual course workload, in general, seems substantial, quite demanding and includes courses which are quite challenging as indicated by the undergraduate students during their teleconference with the EEAP, but considered essential for their complete knowledge in the field of their expertise. More specifically the 30 ECTS/semester correspond to

750 working hours/semester. The diploma thesis corresponds to a total of 36 ECTS (12 in the 9th and 24 in the 10th semester, respectively) leading to an overall weight factor of 12%. The Department has not yet used this ECTS system for the graduation of the students to date but will adopt it in 2021.

The structure of the program is very rational. In the 1st year Mathematics, Physics, Chemistry and Computer Science are taught together with the very important course of Introduction in Materials Science. Mainly general and special background courses are offered in the 2nd and the 3rd year dealing with Materials Science and Engineering. Special background and specialized knowledge courses are taught in the 4th year and exclusively specialized knowledge courses together with the diploma thesis are attended in the 5th and final year. Thus, the progression of the students throughout all stages is smooth and consistent with all prerequisites. Basic knowledge is initially gained as appropriate leading to specialized knowledge according to the area of scientific interest of each student.

It is necessary to mention that through the obtained funding from competitive projects the faculty members have the ability to link their teaching with research through the elective courses they are responsible for as well as through the state-of-the-art instrumentation they have purchased for their research needs but still give the undergraduate students the possibility to work on them.

The external stakeholders from industry, public sector and foreign companies mentioned, during the teleconference, that the DMSE graduates are very well trained compared to others with similar qualifications. The number of stakeholders the EEAP met was excellent and consisted of representatives from the Municipality of Epirus, the Technical Chamber of Greece, the Federation of European Materials Societies (FEMS), four (4) industrial companies (Thrace Plastics S.A., BIC Violex S.A., GEOTEST S.A., PyroGenesis S.A.) and one (1) foreign company (Netherlands) founded by a former graduate from DMSE (Optiphore B.V.). All stakeholders agreed that the undergraduate study program offered by DMSE leads to very well educated and excellently prepared individuals, who are capable to confront all challenges in attaining employment related to their scientific field.

The structure of the study program is rational, coherent and clearly articulated. The Student Guide for the Study Program is complete, concise and appropriate and offers all necessary information for the Department. A full and detailed description of the course outlines is provided on the website. The study program is revised regularly and is certified each year for the next academic year each May by the General Assembly. The course outlines have been accomplished by communication with external stakeholders according to the needs of the market and technology evolution.

The average GPA is approximately 6.98, which is not considered low, but the department strives to improve it. The average length of attendance to graduation is 6.80 years, which is excellent.

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

- As presented by the OMEA of the DMSE a merge of courses with overlapping elements is under process and coincided with suggestions made by the interviewed undergraduate students.
- Minimize the number of courses per semester, suggested as well by the interviewed undergraduate students, but without losing the complete scientific substance of the study program. This is a suggestion already made by the external evaluation committee back in 2011. Changes have been implemented by moving courses within semesters and altering compulsory to elective courses and vice-versa.
- Change the statistics platform in order to include the students who graduate in September in the previous academic year graduates. In that manner the average years for graduation will be reduced substantially.

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

The DMSE undergraduate program is organized in a positive student-centered learning environment that offers different learning paths. DMSE considers learning to be a continuous interactive process between the teaching staff and the undergraduate students - students participate actively, taking responsibility for their own learning process.

The DMSE study program utilizes a great range of teaching methods depending on the nature of the course (lecture, laboratory, compulsory, elective), the diversity of students and their needs, as well as the year of study. Details for each course and how it will be presented is given by the teaching staff and is analysed also in the Studies Guide or on the DMSE website.

The most common methodologies are lectures with PowerPoint presentations and whiteboard usage, presentation of videos, on-line courses with the use of software and/or electronic notes, tutorials, laboratory courses with hands on experience, case studies and others. The course workload per semester is evenly divided at 30 ECTS/semester leading to 750 hours of workload for each of the ten (10) semesters of study.

The undergraduates' student evaluation is made in order to measure students' commitment and achievement of the expected learning outcomes. The student evaluation is consistent with the established procedures governed by the internal regulations of the University of Ioannina. Any flaws, defects and inconsistencies should be attributed exclusively to the University's administration and the MODIP who are responsible for making all appropriate synergies to improve the process. Already, the hard copy evaluations have been substituted by digital evaluation procedures but there were drawbacks during the first year of compliance.

The DMSE study program ensures fair assessment of students' rights since, in case there are issues after the examination period with the grading the students are able to discuss their assessment after the announcement of the grades and before their final submission to the system as well as are able to be examined by a three-member committee who teaches the same or related subjects in the event of more than three failed exams in the same course. In the latter case the committee is appointed by the Dean of the School of Engineering after the respective request of the student. Both procedures are well elaborated and mentioned in the Greek laws as well the internal rules adopted by the University.

Undergraduate students can address any issues and complains related to the teaching and evaluation process to different parties and depending on the seriousness of the issue, the discussion can be escalated up to the Rector Council of the University or even the Senate. On the other hand, the teaching and supportive staff can also raise issues related to the undergraduate students' behaviour or to other unexpected conditions that may interfere with the teaching and evaluation process. In the latter case, the discussion may start at the Laboratory Director level and may go as high up as the Senate of the University depending on the seriousness of the issue.

The teaching staff provides additional teaching hours where practice problems are solved, and questions are answered in preparation for the exams. The students evaluate any new pedagogical skills introduced; their evaluation has been very positive, especially for the elective courses. In these courses the teachers utilize current research work in their pedagogical approaches in order to advance knowledge in areas related to recent published work. This facilitates independent student thinking and showcases autonomy while offering adequate guidance and support.

It is of great importance to mention the quick adaptation of the study program through the synergies made by the teaching staff concerning the educational capability during the pandemic Covid-19 period (which is still ongoing). The DMSE teaching staff provided prompt solutions to issues by introducing effective Distance Learning and software tools in the teaching process. More specifically, DMSE following the Governmental instructions applied distance learning and evaluation procedures since:

- All lectures were directly shifted to distance learning using MS Teams and E-course platforms.

- All lab courses of spring semester were performed using distance learning methodologies. Most of the lab courses of the fall semester followed the same methodology.
- DMSE supported the learning process using live or video demonstrations of the experiments – some of the courses were also available in video format in E-course platform.
- DMSE is committed to provide access to all students who wish to participate in person in the lab exercises post-pandemic, at a time the virus is under control and their presence in the lab is considered safe.
- DMSE provided access to undergraduate students to perform, in shifts, part of their Diploma thesis when the labs were open (May – Oct) while keeping all the necessary health protection measures.
- Erasmus programs still run with measures and work-from-home practices – Internship programs still run with measures imposed when necessary.

Panel Judgement

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

Panel Recommendations

- The DMSE study program committee should further openly advertise student rights concerning re-evaluation of their assessment. Moreover, the students should know the criteria used for marking.
- The assigned Studies Advisors should have a more prominent role in advising students on how to prepare for exams, of the importance of attending lectures and of the required work effort per course in order to succeed.
- The MODIP of the University should take all necessary actions to improve student participation on course/faculty evaluations. The aim is to reach 50% with the recently introduced digital evaluations, compared to the current 25%. It is important to mention that according to the Vice-rector and the Head of the MODIP this low participating percentage is not only a trend at the University of Ioannina but is observed in all Greek Universities.

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

The Department head and administrative office take specific actions as soon as results on newly admitted 1st year students are announced. Instructions & information for the newly admitted students are uploaded onto the departmental website, which include: Information about the profile of the department, the study program, the registration process, useful tips for the student life, student accommodation (<http://enoikiazetai.uoi.gr/>), the date, time and place of the Welcome Reception Event, which is sponsored and coordinated by the Department Head and Vice-Head. In this event detailed information is given to the admitted 1st year students concerning any need directly tied with student life.

A great amount of information on the undergraduate studies (mission, learning outcomes and professional qualification, curriculum, prerequisites for graduation, GPA calculation, teaching staff, laboratories, Erasmus, Internship, Diploma Thesis, etc.) is provided in specific documents (study guide, academic advisor, registration of courses, diploma thesis, Erasmus exchange program, Internship program, undergraduate studies program) which are uploaded and are always updated frequently in the Department's website.

Based on the Integrated National Quality Information System of HAHE (Ολοκληρωμένο Πληροφοριακό Εθνικό Σύστημα Ποιότητας ΟΠΕΣΠ) the undergraduate students' progress is monitored. The teaching staff organizes supportive actions, such as midterm exams, tutoring, additional homework, etc. based on the targets set by the Department and their individual assessment.

DMSE does not have the ability to provide direct financial support to the undergraduate students. However, financial support in the form of scholarships is possible through various State and Private foundations but the number of students able to take the scholarship is minimal (maybe one per year). The University has a Liaison Office which provides information on major foreign and Greek foundations that offer scholarships annually.

The DMSE supports its undergraduate students' mobility through the Erasmus program. The students primarily utilize the program for the conduct of the Diploma thesis research and for placements opportunities. The DMSE has 10 important bilateral agreements.

Since academic year 2012 – 2013 all graduate students are provided with a diploma supplement based on the Diploma Supplement model developed by the European Commission and its purpose is to provide sufficient independent data to improve the international concept of the excellence provided by the DMSE undergraduate program.

The Diploma Thesis comprises a crucial part of the study program since it covers 36 ECTS (12% weight factor on the overall weight factor of the study program). The framework and regulations of the diploma thesis are very thoroughly presented in the department's website (<http://www.materials.uoi.gr/files/kanonismos-diplomatikis-ergasias.pdf>). It is worth noting that more than 90 peer-reviewed journal/conference papers included diploma-thesis students as co-authors during the period 2015-2020 (out of a total of 322 diploma theses).

The Internship of the undergraduate students of DMSE is an approved optional activity and has been included in the study program as an elective course in the 8th semester. It should be mentioned that 2 ECTS are given for completion of the internship for those students involved in the specific program. The duration of the internship is 2 months, and the overall information and details are well described in the Department's website (<http://www.materials.uoi.gr/files/kanonismos-praktikis-askisis.pdf>). DMSE utilizes all the available positions of the Internship program and most of the students try to benefit from the program before graduation. The number of applications is higher than the number of offered positions, however, 563 vs. 361 for the period 2010-2019. This is unfortunate, since it is a very good opportunity for the undergraduate students to gain experience in industrial research and be exposed to SMEs and the public sector environment.

Panel Judgement

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

Panel Recommendations

- The internship program should allocate more positions to satisfy a larger number of students.
- The duration of the internship should be increased.
- The Department's website in English should be more detailed and include all the information given in Greek.
- Having incoming Erasmus students to the DMSE is important. To this end, teaching some elective courses in English is strongly advised.

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

There are 23 tenured faculty members, 4 academic scholars, 6 laboratory teaching staff members (EDIP) and 4 laboratory technical staff members (ETEP) in the department. Almost all faculty members have extensive international experience. Teaching feedback comes primarily from the undergraduate students' course/faculty assessment. This process helps the staff to identify problems and failures, and implement changes that improve their teaching performance, pedagogical methods and presentation of their course. Crucially, the students' assessment of the teaching performance of staff is considered in their promotion. The General Assembly of the department applauds the teaching staff members who excel in the student evaluation process.

DMSE is fully compliant with the Greek legal framework of faculty/research & teaching staff recruitment and follows its transparent, fair and clear processes. It has to be noted that a large proportion of the process happens online (APELLA system) with all minutes and documents accessible to applicants. Apart from the research competence scrutiny (which is extensive), the applicants teaching ability is also assessed through a teaching lecture during the recruitment process. The academic unit promotes ample opportunities for the professional development of the research & teaching staff by giving permission for extensive visits to other academic institutions, participation in national and international conferences, research seminars and teaching activities in other universities in Greece and internationally. It is noted that the department not only encourages such activities but it also (at least partially) funds them as far as its resources permit. External sources of funding (such as ERASMUS+) are also used. Furthermore, the research & teaching staff have been extremely successful in attracting external research funding (at an almost exponential growth since 2016) which also helps in this

direction. It is clear that the department has managed to attract high-quality personnel and has given them the opportunity to further develop and progress. The research ethos of the academic staff is exemplary and high-quality and -quantity research output is promoted and valued. A substantial proportion of funding originates from EU (H2020); a funding source which is extremely competitive. Moreover, the members of the department have attracted considerable funding as coordinators or principal investigators in H2020 grants, exemplifying the research leading performance of the academic staff at DMSE. This is also apparent by the extremely high-quality experimental and computational resources that the staff have managed to secure from external sources of funding including major international companies. These facilities cover studies in all major areas of materials such as metals, polymers, ceramics, biomaterials, nanomaterials, materials for sensors, electronic materials, smart materials, composites and nanocomposites. There is a well-thought-out research strategy to cover these major areas of materials and their applications, which helps the teaching activities of the department as well. In fact, many research labs are used also for teaching activities such as Diploma Thesis projects; there is an excellent link between research and teaching activities as verified by our discussion with the students and graduates of the department. New junior members of teaching and research staff are imbedded in a research group and they teach in connection with a more experienced colleague, who plays the role of mentor. These measures ascertain the smooth and seamless passage of junior staff to the ethos and values of the department, which is student focused. They contribute immensely to their professional development and career progression. The publication output of the members of staff is commendable in both quantity and quality (demonstrated by the increasing volume of citations) and there are provisions and mechanisms for continuing this exemplary performance. Moreover, the members of staff have devoted considerable portion of their time and adapted efficiently to the new requirements of successive lockdowns due to COVID-19 pandemic; they have introduced innovative teaching in their study program including excellent provisions for on-line lectures, tutorials and various innovative methods for on-line exams and remote/virtual access to laboratories (which constitutes a major challenge in lockdown conditions).

Last but not least, the Panel was very impressed by the list of external collaborative institutions of high esteem such as MIT, Harvard, Cornell, Yale, Rice, Texas A&M, UCSB, Penn State, UPenn, UT & Knoxville, RPI, UMass @ Amherst, University of Manchester, Cambridge University, University of Groningen, University of Basque Country, Moscow State University, ADNOC Petroleum Institute, National Tsing Hua University @ Taiwan.

Panel Judgement

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

Panel Recommendations

- The department could contemplate the introduction of an informal process of annual reviews/appraisals of junior staff by senior staff (we accept that a formal process might not be compatible with the Greek system). This could give an opportunity for some more structured guidance for career progression.
- Formalize mentoring processes for newly hired staff. Mentors should be experienced academics outside the research grouping (if not the department itself) of the newly hired staff member.
- Formalize teaching instructions and broad educational knowledge acquisition for junior staff upon their appointment.

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

Direct state funding is minimal, but the members of staff have excelled in attracting external funding for research, which is also used for teaching activities in an exemplary manner. This involves the purchase and operation of state-of-the-art equipment, which is very important for the students of a department, with a cutting-edge technology focus (materials and their engineering applications). The University central facilities such as Library, Students' Restaurant, IT systems, Student Residence Halls, and Student Housing provisions are excellent, but the current departmental building is inadequate for all of its demanding and expanding teaching and research needs. The department is not in control of the number of new students and regularly welcomes many more (double) than the number justified by its premises and staff count. Despite the unfavourable student-staff ratio, the members of staff have excelled in attending carefully and comprehensively to students' needs and they have to be congratulated on their efforts and excellent results. However, the strain on the staff is enormous and this is not sustainable. There is a need for recruitment of more members of staff and expansion of the department building. They need more than double their current space to accommodate adequately the department teaching and research. The department requires more space for laboratories, academic offices, larger classrooms and in particular at least one large auditorium. The student support is commendable and encompasses the enormous efforts of the departmental secretariat, central administration (internal quality assurance) and academic studies advisors. There are good provisions for discussing, assessing and deciding the allocation of available resources in a fair manner. These include the allocation of teaching laboratories, laboratory consumables, allocation of courses to staff, and arrangements for an efficient overall timetable for classes and examinations. All these issues are discussed openly in the

Department's General Assembly, which involves all members of staff and decisions are transparent. The General Assembly is aided by specialized feed from the relevant (for each theme) departmental committees (Committee for Economic Affairs, UO Committee, Lecture-Exam Committee, and Committee of Laboratories).

First-year students are welcomed formally by the department and are kept informed of issues regularly by the secretariat through announcements at the website of the department. Furthermore, the new but effective Studies Advisor provision is utilized by many students and has been proven to be instrumental for a direct student support and career development. There are excellent provisions for student support, accommodation & boarding, transportation, access to the university restaurant; in addition to various other support services covering a large spectrum of needs from employment and career to health care, specialized psychological support and disability services.

Specific IT resources and associated tools which contribute to the learning experience include: Ecourse Uoi Platform (<http://ecourse.uoi.gr/>), Office 365, Turnitin Originality Check software, WiFi/Eduroam (<http://noc.uoi.gr/services/eduroam.html>), Users Website.

Panel Judgement

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

Panel Recommendations

- Provide information regularly (and include this information in the course/program guide) to students about their rights and associated processes regarding reporting of issues and problems that might arise unexpectedly.
- The University, local authorities and government should take a more favourable look at the space situation of the department. The current allocation of space is inadequate and a significant threat to the development of the department's teaching and research activities which are highly successful. It has to be stressed yet again that DMSE is exceptionally successful in attracting external funding and providing an outstanding student experience. In our view, this is the most critical problem of the department, which is beyond its direct control. Our recommendation is for a new building (adjacent and connected to the existing one) constituting a DMSE building complex which will house all activities and provide a suitable home for all students and staff of the department. This will enhance a much-needed sense of belonging to all DMSE students and staff.

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

The University of Ioannina provides a complete student IT system which collects and maintains all the relevant student information including personal details, year of study, enrolled courses and marks. This comprehensive system provides the means of statistical analysis and monitoring of the student numbers, their assessment and marks. The department takes full advantage of this resource. Furthermore, the CLASS WEB application allows all teaching staff to communicate efficiently with their students (announcements, office hours, contact details), provide educational and administrative material (e.g., timetable) in a timely manner; the same tool allows the communication of marks, feedback and access to statistical data related to the courses taught.

The department's secretariat provides useful and timely information to all undergraduate students such as department announcements, exam scores and application forms.

The main tool of collection of students' opinions is the evaluation questionnaires administered by MODIP, which cover a wide range of relevant information, from general teaching satisfaction to evaluation of infrastructure. The data are useful to each teaching member of staff and they provide direct feedback on their performance and give them the opportunity to re-evaluate their teaching method and style. The results of the satisfaction questionnaires and the key performance indicators are discussed in detail in the General Assembly of the Department, and this allows the determination of actions and priorities in order to achieve the quality objectives

of the Department. The responses to the evaluation and satisfaction questionnaires are statistically processed. The conclusions drawn are communicated to the Head of the Department, and the OMEA. Based on these conclusions, OMEA is responsible for making recommendations on targets and actions to meet the department's quality policy. In collaboration with the UP Committee and the General Assembly these results are discussed and streamlined. Actions around revisions/reforms of the UP and adjustment of the teaching methodologies are implemented through the procedures already described.

Additional sources of information include:

- The Integrated National Quality Information System of HAHE; information includes general guidance, structure and organization of studies, electronic class, internship related information, students' admission, students' population, students' accessibility, students' mobility – internationalization, graduates' population, graduates' performance, graduates' employment, teaching staff, the department – Identity, active, resigned and retired personnel, personnel's promotion and mobility, staff with contract, financial data, infrastructure, and research activity;
- ΔΑΣΤΑ and Erasmus provides information on internships and Erasmus scholarships, respectively;
- The Alumni Association provides information related to the graduate employment.

Panel Judgement

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

Panel Recommendations

- It will be useful to collect information and relevant data in a more systematic manner from other stakeholders such as the department's graduates, industrial and academic partners, other scientific bodies and agencies where the students conduct their internships, visiting academics, etc.
- Many hardcopy forms can be moved on-line and maintained in this way in a more efficient manner; this will provide the means for a more efficient long-term storage and facile statistical analysis, and the timely monitoring of current affairs and issues arising.

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

The study program is fully compliant with principle 8. The public webpage of the Department (<http://www.materials.uoi.gr/>) makes available information on the Department's teaching and academic activities that is useful for prospective and current students, graduates, other stakeholders and the public. This includes:

- The study guide is downloadable from the main page. It contains information about the field of study, the professional rights of the graduates, and the quality assessment program and its goals. It also contains information on the structure and governance of the Department. More importantly, it provides an overview of the undergraduate program. This includes general procedural information on maintaining good student status, the programs offered, including opportunities such as the Erasmus and practical trainings, fellowships, academic calendar, and course content. The guide includes information on graduate study as well as a wealth of other useful entries on housing and meals, healthcare, available career resources, and student clubs. Overall, this document is an excellent resource.
- The undergraduate tab provides information about the program of study, relevant rules and regulations, the concept of the Studies Advisor, the diploma thesis, practical training, and the "katataktiries" exams. Under this tab, one can find detailed course information in downloadable PDF files. For each course, some general information is provided, including the link to the internal course webpage. The expected learning outcomes are discussed next. The course content is outlined, followed by a discussion on the teaching and learning methods and the assessment process. Finally, the relevant literature is listed.
- Other information that is readily available is general information on the Department, details on the research infrastructure, course and exam schedules, and announcements related to academic life.

The information is clear and objective. It is discussed in language that is easy to understand by students and the public, without the frivolous use of jargon and acronyms, and without superlatives and hyperbole. Course information is given in tabulated form, which makes it easy to find specific information (e.g., course content) and enables easy comparison of elective courses.

The information is accurate and up to date. The study guide is updated annually and appears to be accurate, something that is supported by our discussions with the students, who were very positive on the usefulness of the study guide. Other information is also updated: The date of the last announcement (16/12/2020, which is the day before this part of the report was compiled) and the frequency of announcements shows good maintenance. The webmaster's information is provided for requesting comments and corrections.

Finally, the information is readily accessible through the world wide web at <http://www.materials.uoi.gr/>.

Panel Judgement

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

Panel Recommendations

Overall, a wealth of information regarding the program is available through the public website of the Department, certainly enough to satisfy principle 8. We congratulate the Department and urge them to keep up the good work. As a minor suggestion, we would like them to consider adding to their website prominent links to:

- Health and safety information for emergencies, both global (University campus) and local (Department's buildings).
- Code of behaviour, especially with respect to underrepresented groups.

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 study program is fully compliant with principle 9. Regular monitoring, review and revision of the study program is undertaken according to goals set by the Department and displayed on their public website.

The goals of the Department's assessment, as they pertain to the undergraduate program, is the continuous improvement of the undergraduate program of study aiming to achieve learning outcomes in agreement with European and National guidelines. This includes review of the suitability of the structure and organization of the program of study, the provision of high level, holistic education that includes providing the students with skills that support their transition to the working environment, and the provision of education that improves student performance and satisfaction through mechanisms that include feedback and the concept of Studies Advisor. These goals aim to maintain the level of educational provision and to create a supportive and effective learning environment for students.

To achieve these goals, the department conducts an annual review and internal inspection of their quality system. This is conducted by the Department's Internal Evaluation Team and the Quality Assurance Unit of the University. The review is conducted using metrics that quantify the content of the program ensuring that it is up-to-date and in tune with what is needed by society, the progress and academic achievements of students, the effectiveness of the assessment process, the satisfaction of students, and the learning environment. The results of the evaluation are discussed in the Department's general assembly and this enables to define corrective actions to ensure the continuing achievement of the Department's goals. All this information is available on the Department's public website. Finally, the revised program is published in the annual study guide.

Panel Judgement

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

Panel Recommendations

Overall, there is sufficient on-going monitoring and periodic internal review of the program, certainly enough to satisfy principle 9. We congratulate the Department and urge them to keep up the good work. As a suggestion, we would like them to consider developing an Industrial Advisory Board, as a formal mechanism to get feedback from industry. If this is politically unfeasible, they should consider organizing a “Day of Industry”, where they invite companies they collaborate with/send students to, to establish a regular dialog with faculty and students. An industrial research seminar would also be a good opportunity to foster further links.

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 HAHE organized an external evaluation of the Department in September of 2011, and this included an evaluation of the undergraduate program. The external evaluation committee consisted of Prof. A Panagiotopoulos (Princeton University, USA), Prof. M. Mavrikakis (University of Wisconsin-Madison, USA), Prof. Th. Moustakas (Boston University, USA), Prof. E. Papoutsakis (University of Delaware, USA), and Dr A. Stassinopoulos (Assoc. of Manufacturers of Packaging and Materials, Greece). The committee met with the Rector of the University, the Chair of the Department, members of the Department's Internal Evaluation Committee, faculty, staff, and students. They attended presentations on the educational programs and research activities of the Department and visited facilities on campus. A similar template was used in this year's evaluation, with three notable differences: (a) the evaluation was conducted online due to the COVID-19 pandemic, (b) only the undergraduate program was evaluated, and (c) additional meetings with graduates and stakeholders including representatives of industry and government took place.

Relevant to the undergraduate program, the 2011 committee considered:

- Undergraduate curriculum: They reviewed (a) the approach taken, including its goals and objectives, its structure and content, and its intended learning outcomes, (b) the implementation, including its rationale, functionality and effectiveness, (c) the results, including ways to maximize success while dealing with potential inhibiting factors, and (d) issued conclusions and recommendations.
- Teaching: they reviewed (a) the approach taken, including the pedagogic policy and methodology, the means and the resources, (b) the implementation, including the quality and evaluation of teaching procedures, teaching materials and resources, and mobility, (c) the results, including the efficacy of teaching and the understanding of positive or negative results, and (d) issued recommendations.

Panel Judgement

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

Panel Recommendations

Overall, the regular external evaluation of the undergraduate program satisfies principle 10. We congratulate the Department and urge them to keep up the good work. We find that this year's process has improved by including stakeholders from industry and government.

PART C: CONCLUSIONS

I. Features of Good Practice

- Well organized course curriculum. Fundamental courses start at an appropriate level for entering 1st year students and build up quickly to raise student competencies. Given the interdisciplinary nature of MS&E, students are required to take courses in Physics, Chemistry and Materials Engineering, as well, as courses in Mathematics and Computer Science.
- Rigorous theoretical courses are offered, as indicated by examples of homework and examinations presented.
- Laboratory courses are well equipped and taught by very qualified teaching staff.
- Courses are taken at the appropriate time sequence.
- Students are assigned Studies Advisors, who can advise and guide them through their undergraduate education process.
- Diploma thesis is compulsory and of high scientific merit, often resulting in student co-authorship in scientific publications.
- Access to practical training internships in industry. The department has cultivated strong ties with many industrial partners offering internships to students.
- Students of the department are very competitive for the ERASMUS exchange program and take advantage of this unique experience. The students are mainly using the program for Diploma thesis and for placements opportunities. The DMSE has 10 bilateral University agreements - France (Un. Poitiers), Italy (Un. Calabria, Un. Campania), Spain (Un. del pais Vasco, Un. Oviedo, Un. Euskal Herriko), UK (Un. Ulster), Norway (NTNU), the Netherlands (Un. Groningen), Rumania (Un. Iasi).
- Many elective courses for upper-level students are offered giving students a wide range of scientific topics to choose from. This enables them to attain some level of specialization during their undergraduate career.
- The presence of graduate programs (MSc, PhD) in the department and strong faculty involvement in research are very beneficial to the undergraduate program. Students have a large choice of topics and first-rate faculty to choose from for their Diploma Thesis.
- The curriculum is constantly updated to keep it current and responsive to employment market demands for their graduates.

II. Areas of Weakness

- The need for a new building and infrastructure was strongly expressed and demonstrated during our visit. Allocated classroom, office and research space does not meet the needs of the department. The lack of large-sized classrooms and a dedicated auditorium were especially noted. Due to lack of space, some instructional labs have to be taught in research labs, interrupting the continuous performance of research. The department has procured new research instrumentation but has no space to house it.
- The large student-to-faculty ratio should be alleviated by reducing the number of entering students and enhancing the teaching staff and Faculty. This will foster better interaction between students and faculty, improving knowledge transfer and the average GPA. It will also increase the number of students graduating in 5 years and the overall graduation rate of the department.
- Efforts should be expended to increase the number of students who complete the course/faculty evaluation forms, since information garnered is invaluable for strategizing and further improving the course curriculum.
- Efforts should be made to increase the number of industrial partners who offer practical training internships to students in order to decrease the gap between the number of available positions and the number of applicants. To this end it is suggested that they consider organizing a “Day of Industry”, where they invite companies to visit the department in order to establish a regular dialog with faculty and students. Industrial research seminars would also be a good opportunity to foster further links.

III. Recommendations for Follow-up Actions

- The EEAP considers the insufficient space allocated to the department to be a major problem, which stifles the proper functioning of the undergraduate program and impedes the growth of the department. This is an urgent problem that demands the immediate attention of the University administration.
- The department should promote its name recognition, the great educational value it delivers and the Science & Engineering of Materials as an independent field of Engineering in Greece.
- The department should be continuously engaged in discussions with the Technical Chamber of Greece to resolve any additional issues concerning the professional rights of the graduated Materials Engineers.
- The department should initiate the necessary actions in order to claim the possibility for appropriate teaching specialty (Π.Ε. = Παιδαγωγική Ειδικότητα) in public primary and secondary education through the ΑΣΕΠ examination system for its graduates.

IV. Summary & Overall Assessment

Overall, the EEAP was very impressed with the quality of the undergraduate program offered by the DMSE, which is unique in the whole of Greece. The faculty, teaching staff and administration of the department must be commented for the superior service and career opportunities they offer to their students. The department is defining new roadmaps for Engineering education in Greece, and employment in cutting-edge research and development (R&D) positions in novel electronic, magnetic, polymer and biomedical materials and devices.

The Principles where full compliance has been achieved are: **Principles 1 - 10**

The Principles where substantial compliance has been achieved are: **None**

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. Professor Georgia Papaefthymiou (Chair)**
Villanova University, USA
- 2. Professor George Malliaras**
University of Cambridge, United Kingdom
- 3. Professor Vasileios Koutsos**
The University of Edinburgh, United Kingdom
- 4. Dr. Athanasios Katsouras**
Technical Chamber of Greece