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HELLENIC REPUBLIC

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HELLENIC QUALITY ASSURANCE
AND ACCREDITATION AGENCY

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

Electrical and Computer Engineering

Institution: University of Patras
Date: 15.07.2019

Report of the Panel appointed by the HQA to undertake the review of the
Undergraduate Study Programme (Integrated Master) of
Electrical and Computer Engineering of the **University of Patras**
for the purposes of granting accreditation

PART A: BACKGROUND AND CONTEXT OF THE REVIEW

I.   The Accreditation Panel

The Panel responsible for the Accreditation Review of the Undergraduate Study Programme (Integrated Master) of **Electrical and Computer Engineering** of the **University of Patras** comprised the following four (4) members, drawn from the HQA Register, in accordance with the Law 4009/2011:

1. Prof. **Georgios Kontaxakis** (Chair)
   Universidad Politécnica de Madrid, Spain

2. Prof. Emeritus **Nikolas Spyratos**
   Université Paris-Sud XI & CNRS, Paris, France

3. Prof. **Evangelos E. Milios**
   Dalhousie University, Halifax, Canada

4. Mr. **Sotiris Michalopoulos**
   Technical Chamber of Greece, Greece

II. Review Procedure and Documentation

ADIP provided the Accreditation Panel (AP) with the material to be reviewed for this Accreditation Review on 23/5/2019. The material included copies of documents submitted by the Electrical and Computer Engineering (ECE) Department of the University of Patras (UoP) to facilitate the accreditation process. Among these documents were:

- The Proposal for Accreditation of the Internal Quality Assurance System for the ECE Department of the UoP (which was submitted to HQA on 8/4/2019).
- The Department's Internal Studies Regulation, the Studies Guide for 2018-19 and detailed outlines (both in Greek and English) for all courses offered by the programme.
- The Internal Quality Assurance Policy and a document with the Department's Quality Objectives (with horizon 31/12/2020 the latest).
- The Department's Regulation for Practical Training.
- The template for the Diploma Supplement (both in Greek and English).
- The templates of the evaluation questionnaires used for the evaluation of the teaching by the students and graduates, as well as aggregated results from these questionnaires from the past one or two academic years.
- The External Evaluation Report (realized in 2013) for the ECE Department.

The week before the site visit, ADIP informed the AP for an (unexpected) modification of the timetable, which would not allow the scheduled briefing at the ADIP premises initially scheduled for Monday, June 10th. This briefing took place by teleconference (via Skype) on Friday, June 7th. During the teleconference AP members were briefed by the HQA President, Prof. P. Kyprianos, the HQA General Director, Ms. Ch. Besta, and Ms. Ch. Dimopoulou from the ADIP staff, on the Quality Assurance (QA) Accreditation mission, standards, and guidelines.

Upon arrival in Athens on Monday, June 10th, AP received additional information and further documentation were provided regarding the HQA mission, standards and guidelines of HQA accreditation process. Moreover, during the site visit AP received extensive information on the University of Patras, its Internal Quality Assurance System (ICAS) and its implementation by the Institution's Quality Assurance Unit (Μονάδα Διασφάλισης Ποιότητας, ΜΟΔΙΠ – MODIP throughout) in an integrated informatics system, as well as on the operations and results obtained by the Department's Internal Evaluation Team (Ομάδα Εσωτερικής Αξιολόγησης, OMEA). In addition, the Heat of the ECE Departments provided a very detailed and extensive documentation of all courses of the programme, including study materials such as books, teaching slides, exercises and exams, a large number of recently competed Diploma Theses, as well as statistical data for each course and student surveys.

AP arrived at UoP in the evening of the same day (10/06/2019) and met informally in its full constitution (all four members) around 9:30 pm. The meetings were scheduled the next day (11/06/2019) starting 9:00 am and lasted almost until 8:00 pm. The first meeting was with the Vice-Rector for Academic and International Affairs and President of MODIP, Prof. N. Karamanos, and other members of MODIP: Prof. Berberidis, Prof. Giannikos and Prof. Karalis, as well as Ms.

Leontara and Ms. Papadatou from MODIP´s Secretariat. Prof. Karamanos welcomed the Panel and presented the University of Patras and the major data related to its constitution and operation. Next, the Head of the ECE Department, Prof. St. Koubias, made a detailed presentation of the Department, which has recently celebrated its 50th anniversary since its establishment in 1967, as the then first Department of the Polytechnic School of the University. At 10:20 am AP met in private with the members of OMEA, Prof. Sgarbas (coordinator) and Prof. Mitronikas, in an extensive meeting which lasted almost two hours and provided AP with a very detailed overview of the main quality-related key performance indicators of the Department and a clear idea on the degree of compliance of the programme to the standards of the Quality Accreditation.

At 12:30 pm the Panel met with ten representatives from the teaching staff, who came from all four Divisions of the ECE Department. The meeting lasted over one hour and allowed AP to discuss with the academic staff a series of issues related to all aspects of teaching related to the programme and student outcomes. Immediately following this meeting, AP met with eight representatives of the students, from different course levels, who take courses offered by all four Divisions. This meeting also lasted for over one hour and has been very illustrative of the students' satisfaction from their study experience and the Department´s facilities and staff. Moreover, the students provided, in a very educated, polite and constructive manner, valuable input related to the quality assurance of the undergraduate programme.

Following a short lunch break, AP members followed Prof. Koubias to a visit of the Department´s main laboratories, classrooms and other infrastructure. During this visit AP was able to meet with research and teaching staff and discuss with them on their main research activities and recent achievements, most of them undoubtedly of first-class quality and top-of-the-line. Immediately upon completion of this visit, which lasted about one hour, AP met in a combined session and starting at 4:45 pm with representatives (nine in total, three of them joining via Skype in a sequential manner) from the programme´s graduates and representatives (another group of nine persons) of employers and companies from the Patras area, as well as of social partners and local administration. This meeting gave AP the opportunity to discuss the Department´s relationship with external stakeholders and gather valuable information and suggestions.

Between 7:00 pm and 8:00 pm AP met in private and onsite, examining the documentation provided and other related information, including samples of student exams, books and training material from selected courses. In the evening, AP met in private and informally until almost midnight, to prepare the concluding remarks to be announced the following day during the closure session.

The closure and de-briefing meeting took place in the morning of Wednesday, June 12th, starting at 9:30 am, during which AP presented its key findings in an informal way, followed by an interesting discussion with the Vice-Rector for Academic and International Affairs, the ECE Department´s Head, Prof. St. Koubias, and members of MODIP and OMEA. The Panel departed to Athens the same day at noon in order to draft the Accreditation Report of the Undergraduate

Study Programme (Integrated Master) of Electrical and Computer Engineering of UoP following the procedures provided by ADIP.

In summary, the ECE Department at UoP organized in a well-prepared and careful manner an extensive schedule of meetings and visits during the site visit. This allowed the Panel members to meet and discuss with the President and members of MODIP at UoP, as well as with teaching staff from all the Department's Divisions and its OMEA. AP had also the opportunity to briefly visit classrooms and undergraduate and/or research laboratories, meet with several student representatives, as well as with a relatively large number of selected alumni, stakeholders and local administrators. Overall, AP was very pleased with the way the faculty, students, administrative staff and external invitees engaged in the process, their friendliness, hospitality and eagerness to demonstrate their best practices in teaching, as well as in their research and innovation initiatives.

The Accreditation Panel would like to wholeheartedly express its gratitude to Prof. Nikos Karamanos for making the process of this accreditation review smooth, based on his past experience and genuine confidence in the high quality teaching standards of the University of Patras and the ECE Department in particular. Furthermore, the Panel would like to make a very special mention to Prof. Stavros Koubias, Head of the ECE Department, who has demonstrated remarkable leadership in the setup of the complete accreditation process, unique dedication to achieving the objectives of the accreditation for the undergraduate programme he directs and an exquisite gentility and deference in his interactions with all participants, staff and panel members, efficiently assisted at all times by the OMEA, , other faculty and administrative staff.

III. Study Programme Profile

The University of Patras (UoP) was founded in 1964 in the city of Patras in 1964 and it began functioning in the academic year 1966-67. The establishment of the University contributed vastly to the decentralization of Academic Education in Greece. In June 2013 the University of Western Greece was incorporated in the University of Patras. There are two campuses, one in area of Patras (Rion) and the second in the city of Agrinion, with an extension of about 4,5 km^2.

UoP is divided into 5 Schools: the School of Natural Sciences, the School of Engineering, the School of Health Sciences, the Department of Humanities and Social Sciences and the School of Business Administration. Here are the most recent UoP figures, taken from the institutional website[1] at the time of the elaboration of this report:

- 32.770 registered undergraduate students
- 3.787 active postgraduate students
- 24 Academic Departments
- 161 Research and Teaching Laboratories
- 17 Clinics
- 633 faculty members
- 191 scientific staff members
- 357 administrative staff members

In addition, UoP has a Sports Centre, a Conference and Cultural Centre, and a Library and Information Centre, which houses a variety of book collections and e-resources and operates the Institutional Repository and various digital collections. Students can use the National Service "Eudoxus" for their text books. Since 2002, UoP has a specific strategy for the development of infrastructure and platforms for e-learning and has recently developed Open Courses and Open Educational Resources available to all citizens. The Educational Centre for Life-Long Learning of the University implements training programs to improve the conditions of Education and Employment for adults.

The Department of Electrical and Computer Engineering (ECE) at UoP has been established in 1967. Currently, it is the largest Department of the School of Engineering (Polytechnic School) at the University, possessing overall adequate buildings, classrooms, laboratory spaces and very good technological infrastructure. The Department currently is divided in the following four Divisions with associated laboratories:

- Division of Telecommunications and Information Technology (Wireless Communications Laboratory, Wire Communications and Information Technology Laboratory, Laboratory of Electrotechnics).

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[1] https://www.upatras.gr/en/students. Data as of 31/08/2018, excluding new students admitted for the academic year 2018-19.

- Division of Electric Power Systems (Electromechanical Energy Conversion Laboratory, Electrotechnic Materials Laboratory, Power Systems, Renewable and Distributed Generation Laboratory, High Voltage Laboratory).
- Division of Electronics and Computers (Applied Electronics Laboratory, Computer Systems Laboratory, VLSI Design Laboratory, Interactive Technologies Laboratory).
- Division of Systems and Control (Advanced Control Centre, Laboratory of Automation and Robotics, Systems and Measurements Laboratory, Automatic Control Laboratory).

According to the data provided in the Bulletin for the Academic Year 2018-19[2] the Department has 40 faculty members, 3 teaching and research assistants, 3 members of specialized technical education staff, 4 members of laboratory teaching staff, 7 members of administrative personnel, and approximately 2500 undergraduate and postgraduate students.

The Department offers a five-year Undergraduate Study Programme (Integrated Master) in Electrical and Computer Engineering, which covers the areas of telecommunications and information technology, electrical power systems, electronics and computers, automatic control systems and industrial informatics. The programme is divided in ten semesters and has been radically reformed in 2016. The first six semesters are comprised of compulsory courses common to all students, plus elective courses of general education (of pedagogical, cultural or economic content) and a foreign language and terminology course. At the beginning of the seventh semester, the students have to specialize their studies, by choosing one of the following fields of specialization, while being able to select also basic courses from other fields of specialization:

- Communications
- Information Technology
- Energy Conversion, Power Electronics, Electrical Engineering Materials and Renewable Energy Sources
- Computers Systems
- Electronics and Embedded Systems
- Signal, Systems and Automatic Control
- Communications and/or Information Technology
- Computers and/or Electronics and Embedded Systems
- Cyber-Physical Systems (starting in 2019-20)

(data as indicated in the Bulleting of the Academic Year 2018-192). The tenth semester is devoted exclusively to the realization of the Diploma Thesis, which typically starts in earlier semesters.

In addition, the Department offers a graduate program leading to a PhD degree. It also participates to several multi-disciplinary postgraduate programs: "Integrated Hardware and Software Systems" (in cooperation with the Department of Computer Engineering

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[2] http://www.ece.upatras.gr/images/Announcement_files/Bulletin2018-2019_v1.pdf

and Informatics), "Processing Systems of Signals and Communications", "Green Electric Power and the Advanced Network Infrastructure for its Management and Economy" (in cooperation with the Department of Physics), Biomedical Engineering (in cooperation with the Departments of Mechanical and Aeronautics, Computer Engineering and Informatics and the School of Medicine), "Space Sciences Technologies and Applications", "Human-Computer Interaction", "Applied Optoelectronics", and "Computational Linguistics".

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 Programme has quality monitoring and enforcement at two levels: MODIP at university level, and OMEA at department level. MODIP and OMEA cooperate well. Among other tasks, OMEA monitors student class evaluations, and class grade distributions through the Electronic Secretariat information system[3] and brings any issues that arise to the General Assembly of the department. The internal processes of MODIP are well documented. MODIP pre-certifies study programmes prior to their external evaluation and certification. The

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[3] https://www.upnet.gr/progress/

results of all the quality assessment processes carried out by MODIP are posted on its web site[4].

- The Department carries out **annual internal quality assessments**, the reports of which are posted on its web site[5].

- The internal quality assessments are extremely comprehensive and highlight the achievements of the department in terms of professional recognition, best paper and other research awards, organization of conferences, workshops and summer schools, the evolution of the number of faculty and students, both undergraduate and doctoral, department committees, pass rates of students in classes, GPA distributions of graduating students, average time to graduation, summaries of course evaluations, extroversion of the department and participation in Erasmus.

- The Department established an **International Advisory Board** which meets approximately once a year and advises on potential improvements of the Department based on their international academic and industrial experience.

- Overall, the opinion of the panel is that the department is **very well organized with respect of internal annual quality assessment** of all aspects of the mission of the Department and supporting services.

Panel judgement

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

Panel Recommendations

➢ The Panel recommends the establishment of an Industrial Advisory Board, to strengthen the ties of the Department with local industry and non-profit / government sector, who are employers of a significant fraction of the department's graduates, and provide practical training positions to students. The Industrial Advisory Board would nicely complement the activities of the Committee of Extroversion and external fundraising of the Department, and provide annual feedback on the study programme from the perspective of industry needs.

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[4] https://modip.upatras.gr
[5] http://www.ece.upatras.gr/gr/evaluation-menu/int-evaluation-menu.html

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 Department has a **clearly defined mission**, which complies with the current legislative framework that regulates the profession of Electrical and Computer Engineer in Greece, and focuses on the comprehensive undergraduate education of engineers, with a widespread scientific background, able to design and implement complex systems for telecommunications, information technologies and processing, electronics, robotics and automatic control, as well as electric power and materials.

- The Department's Head, Prof. Koubias, explained that **Excellence** is the main element that guides the Department's vision. This vision reigns throughout the programme's development, which aims to form Electrical and Computer Engineers with both general and specific competencies and high level theoretical and practical background in the field of their expertise, able to significantly contribute to their country and achieve international recognition, as significant scientific manpower in Greece.

- The programme has continuously evolved since the Department's creation in 1967, with milestones the adoption of the current denomination as programme on Electrical and Computer Engineering in 1995, the adoption of ECTS in 2010 and its most **recent reform in 2016.**

- For the elaboration of the current programme after the 2016 reform, the Department has **seriously taken into consideration the recommendations provided in the External Evaluation Committee in 2013**. After the latest reform, the number of courses required for the Diploma has dropped from approximately 80 courses (according to the External Evaluation Report of 2013) to 60, according to the data provided by the Department´s OMEA.

- The programme´s learning outcomes and the intended professional qualifications to be acquired by the graduates upon successful completion of their Integrated Master fully comply with the established National Qualifications Framework for Higher Education.

- The current programme foresees a first cycle (first six semesters) with common courses for all students and a second cycle (three semesters) where students can choose to attend a list of courses from nine different specializations, which adequately cover the current spectrum of knowledge in the field of electrical and computer engineering. The **9th specialization (Cyber-Physical Systems)** will be introduced for the first time in the next academic year (2019-20). This constitutes a very good indicator of the **flexibility** of the study programme and its **adaptability** to the requirements of the changing science and knowledge in the field.

- One of the strongest and more solid elements of the study programme is the **Diploma Thesis** (Διπλωματική Εργασία), which is assigned 40 ECTS. This corresponds to a significantly higher workload of similar Final-Year or Master's Thesis project works at other international higher education organizations. The entire 10th semester of the programme is dedicated to the completion of this thesis (30 ECTS) and the remaining (10 ECTS) part of its workload can be associated with the two previous semesters. An elaborate and clear regulation is in place within the Studies Guide regarding the assignment, realization, public defence and evaluation of the Diploma Thesis.

- At the same time, the completion of the Diploma Thesis constitutes the strongest **link of teaching with research within the programme**. Overall the quality of the Diploma Theses completed in the Department is **very high** and introduces students to research methodology and current scientific literature. It also gives them the opportunity to acquire important skills, such as public speaking and bringing science closer to general audiences, since thesis defense is open to the public. Additionally, it allows them to get acquainted with scientific dissemination practices, as some of these works are also presented by the students at formal scientific meetings and conferences.

- The publication of the final document of the Diploma Thesis on the Nemertes web repository[6] of the University is very positive.

- The study programme is supported by a very strong and very **well equipped series of teaching laboratories**, which are also closely linked with the research activities of the Department´s teaching and research staff.

- After a lengthy meeting with eight student representatives, the Panel concluded that students are well aware of the strengths and weaknesses of the study programme and their opinions might be channeled to the Department, mainly through their interaction with

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[6] http://nemertes.lis.upatras.gr/jspui/

teaching staff during their Diploma Thesis work, and serious consideration of the student class questionnaire responses.

- The new study programme includes an **introductory course (2nd semester) on the Science of Electrical Engineering**. This course offers students a general and integrated overview on the topics of their future studies within the programme and helps them develop those basic skills necessary for their future academic and professional careers. Both students and teaching staff have expressed their **very positive opinion on this course** and the Panel agrees that the inclusion of such courses in the study programme is very beneficial.

- The Panel held a fruitful meeting with a large group of eighteen representatives of alumni, employers and social partners. **All stakeholders expressed very positive opinions on the impact of the programme** on their professional development (alumni), the qualities and competencies of the recent graduates (employers) and their integration within the region's productive sector and wider community (social partners).

- Work experience for the students is adequately provided through the successful, although optional, realization of **internships (practical training)** within a company from the area and for a maximum of 3 months funded by Government sources (ΕΣΠΑ). The Department strongly encourages such training experiences, which are equivalent to one elective course (4 ECTS), although both students and employers would have preferred longer periods for this training and more intense involvement of the host company in their supervision and guidance.

- The Department has made conscious efforts to **diminish the inborn resistance of students to have stakeholders and representatives from the labour market approach the Institution**. The programme's Advisory Board includes honorary doctorates from high-profile researchers from the international industrial sector.

- Detailed information and data have been provided by the OMEA on the performance and progression of students throughout the stages of the programme.

- The Department has provided sufficient evidence that the relevant regulatory framework for the approval of the current undergraduate programme has been properly followed and this has also been the case for the official procedures for the approval of the programme by the University of Patras. Moreover, starting in this academic year (2018-19) the Department implements the currently established institutional regulations towards the partial revision and reform of the study programme on annual basis.

- The Department's mission and vision, although clear in their concepts, are expressed with different wordings in the various documents provided to the Panel (i.e. the PowerPoint presentations vs. the Department's Quality Policy document) and are not clearly and visibly presented in the Department's web site. The **use of a consistent language across all documents** would greatly enhance readability and clarity of presentation.

- Students are expected to actively participate in the meetings of the Department's General Assembly, as well as to the deliberations of the Undergraduate Study Programme and Course Registration Committee, however apart from sporadic and individual cases, their active

involvement has **not yet reached a critical mass in order to make their voice clearly heard in these bodies**.

- The smooth progression of students throughout the programme still encounters the obstacle of the **lack of established prerequisites**. The Department has adequately identified the need to establish such prerequisites, however a clear solution to this issue still faces serious objections by the students and has been only partially and rather indirectly resolved by establishing a maximum number of ECTS each student can take each semester.

Panel judgement

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

The 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

➢ Both students and external stakeholders pointed out the need for **training in soft skills,** complementing the Department's initiative to include courses such as the "Introduction in the Science of Electrical Engineering". This could be addressed by further streamlining the theory and laboratory courses to make room for introducing project-based classes, through which students get training in project management, team work, as well as in creative, design, presentation and time management skills.

➢ The Department declared its interest to **introduce courses taught in English**, also following the recommendation of the 2013 External Evaluation Report. When this is possible and the legal framework allows teaching in English at undergraduate level, the Department should carefully consider the cases of students who do not possess sufficient level of English knowledge when admitted at the programme. Alternatively, the Department could consider offering in parallel the same course in Greek, too.

➢ To further improve the integration of the students in the productive sector, and according to the ideas expressed by the employers and social partners, the Department can organize related events, such as **Career Days** or **visits ("excursions")** to important and unique infrastructure available at nearby companies.

➢ The Department should seriously consider the **establishment of stronger teaching collaborations with other Departments within the Polytechnic School** (i.e., Computer Engineering and Informatics Department (CEID), Mechanical Engineering and Aeronautics Department (MEAD)), especially within the framework of the most demanding infrastructure

and equipment, as well as in specialized staff, laboratory courses. One suggestion in that direction is to establish a **"horizontal action" between the ECE and CEID departments on data science,** a field of high current interest. Such an action would combine the newly introduced ECE specialization on cyber-physical systems with appropriate CEID specialization(s), thus sharing course teaching as well as research activities and laboratory infrastructure.

Principle 3: Student-cantered 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 programme allows students to select from **nine different specializations** during the three last semesters of their studies, which offers focused learning paths. Students follow in total sixty courses out of a global offer of approximately one hundred fifty courses.
- Course outlines are available both in Greek and English, follow a common format and are described in very good detail and are complete, including detailed descriptions of the syllabus, learning outcomes, course evaluation procedures and recommended bibliography.
- Student surveys are regularly realized at the end of each semester for each course. These surveys include a **comprehensive and well elaborated questionnaire** for the evaluation of the quality and effectiveness of teaching by the students.
- Through the Panel's interview with the students' representatives, it was evident that students overall **evaluate positively** the availability of professors to interact with them, they feel they receive adequate stimuli from teaching staff and are in general satisfied with the learning

outcomes they acquire. Moreover, the teaching process adequately promotes mutual respect between students and teaching staff; professors have also expressed **their satisfaction** with their interaction with students. In the past few years, the Department reported it has not suffered from noteworthy violent and inappropriate behaviour by student groups, as it has been the case at other Higher Education Institutions in the country.

- It is a positive aspect that there is a limit of one per year on the number of final examinations the students can retake to improve their course grade, and that the grades on both the original exam and the repeat exam appear in the transcript.

- There was no sufficient evidence that the programme regularly evaluates the modes of delivery of the learning outcomes or the pedagogical methods for each course aiming at continuous improvement. Moreover, students pointed out that some professors might employ more strict criteria than others on their expectations, and there was evidence that it is not easy for students to reach excellent scores in their final marks. Reportedly the OMEA examines the grade distributions in each class, and communicates abnormalities to the instructor. In our opinion, the Department over-relies on the Diploma Supplement to compensate for abnormal grade distributions, which may hurt students wishing to pursue graduate studies outside Europe.

- Students also commented that, despite the fact ECTS has been properly implemented, the bulk of the **workload** that corresponds to the number of credits for each course is often **assigned towards the end of the semester** (term projects, final exams, etc.) instead of being uniformly distributed along the whole academic period. Moreover, students are concerned about the heavy workload of the courses during the first study cycle (first three years), the inadequacy of the books and study material provided in some courses and the weak use of virtual classroom (eclass[7]) functionalities.

- The **level of the students' attendance in class**, especially in lower year courses and as the semester progresses, is improving, however it is not yet fully satisfactory.

- Although the Panel verified that the OMEA has access to the detailed results from the student surveys, there was **no sufficient evidence that these data are exploited by OMEA, the Department or MODIP towards the continuous improvement** of the quality and effectiveness of teaching.

- No sufficient evidence has been provided on the **ways the Department handles student complaints**. Students reported that their criticism and complaints do not efficiently reach the decision making elements of the Department. Moreover, the current procedures for the completion of the electronic evaluation questionnaires and surveys do not favour the students' participation in their completion and it has been observed that there is a relatively low rate of responses in these surveys.

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[7] https://eclass.upatras.gr/

Panel judgement

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

Panel Recommendations

➢ **Analyse the results from the students' questionnaires and develop appropriate mechanisms and procedures for the continuous improvement** of the effectiveness and quality of teaching at both individual (teaching staff) and course levels.

➢ It is necessary to **establish the student-centred learning in a more profound way** within the philosophy of the Department.

➢ The Department should generate guidelines for **uniform evaluation criteria** and a **better distribution of the work load** throughout the academic year / semester.

➢ The programme should establish a **wider use of e-class** functionalities in all courses and in a more uniform way. A closer collaboration with students on this matter could help establish the most suited methodological approaches on the use of virtual classroom.

➢ The Department should improve its procedures for students' complaints and their processing.

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 provides an **information / introduction day for all new students each year**, giving lectures, presentations and practical information sessions in order to support a smooth transmission from high school to its environment.

- Student progression is monitored by statistical analysis of the data provided by the "Digital Leap" ("Ψηφιακό Άλμα") Information System that supports the administrative operations of the University of Patras. This information has been analyzed and processed to the department committees by OMEA. A restricted number of courses is allowed for each student, per semester.

- **Student mobility is encouraged** by the participation in the Erasmus initiative and the cooperation with the State Scholarships Foundation (IKY).

- The ECTS system is applied across the curriculum, and extra credits can be given through internship programmes. According to the new department curriculum, students have more choice of courses in order to fill in the required number of ECTS's credits.

- The Diploma Supplement is issued without request for all graduates. This supplement contains detailed information on the holder of the qualification (type and level of the qualification, conditions and rules for the graduation, learning outcomes, the marks received, credits for the corresponding courses, and the ECTS-based rating system).

- An **internship programme (practical training)** is in place mostly during the 7th, 8th and 9th semester, having an additional value of 4 ECTS grades. The Department counts with an extensive network of companies and industries that offer internships to students. Each internship is supervised by a faculty member appointed by the Department.

- It is to be noted that the Department has made a major effort to improve the programme and this despite the lack of sufficient technical personnel to help in the practical training of

the students and the significant increase in the number of students "imposed" by the Ministry every year (almost twice the Department's real capacity).

- There is also a **mentoring scheme** assigning a reasonable number of students to each faculty member. However, students who met with the Panel admitted that mentors are not used much.

Panel judgement

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

Panel Recommendations

➢ Recognition of **those students who demonstrate academic excellence** could serve as reward and motivation for students, and could be awarded either during graduation or other milestone instances during their studies.

➢ The **goodness of the mentoring scheme should be further re-enforced** to the eyes of the students. The Department should make additional efforts to encourage students to make effective use of this beneficial service for them.

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

- The Department adequately follows the legislated process for hiring properly qualified teaching staff. The areas of expertise of new positions are decided by the General Assembly of the Department, upon the recommendation of the Divisions in order to cover the teaching needs defined in the Study Guide. The Department makes use of the nationwide APELLA system to maintain lists of experts for populating the hiring committees.
- The **teaching load of faculty is uniform at 6 contact hours per week, and it is not differentiated based on research productivity** or number of graduate students supervised or external research funding. Research productivity is on average good, while the dispersion across faculty appears to be significant based on information contained in the annual reports of the Department. The research labs visited by the panel were active, well connected with international efforts and well funded externally. It is unfortunate that some of the faculty who were top performers in research recently left the country to take positions abroad.
- Teaching faculty is evaluated by students through an electronic questionnaire. **Participation of students appears to be at about 10%** of those taking the final exam, based on the per course questionnaire statistics and grade distributions, which include the number of questionnaires submitted and the number of students taking the final exams of the respective courses.
- The Panel noted a **very high variance in the enrollment** of different courses.

Panel judgement

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

Panel Recommendations

➢ The Department is encouraged to establish a **strategic research plan** to adapt the focus of the faculty to modern trends in the field, as they manifest themselves, for example, in calls for proposals by the European Commission, instead of simply replacing staff that retires, in the same research areas. The research plan **should also serve as a guide** on which research areas to recruit new teaching staff (when positions become available), with diversification and evolution of the faculty in mind. Many departments have **a soft policy of avoiding hiring their own graduates**, in order to **bring new ideas and increase faculty diversity**. This may be difficult to implement before the economy rebounds and faculty salaries improve.

➢ The Department has significant **overlap in courses and research with the Computer Engineering and Informatics Department** (CEID). It is encouraging that ECE students can take courses from CEID, and carry out their diploma thesis under a CEID faculty member. The coordination of study program and strategic research plan should lead to better use of teaching resources, and improve the size of the critical researcher mass in areas such as robotics, data science and software engineering.

➢ The Panel recommends a **rotation model**, where instructors are assigned out of a course they have taught for a sufficient number of consecutive years (for example 5). This will promote the updating of the curriculum and prevent the drop in teaching quality resulting after teaching the same course too many times in a row.

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

- The Department has all the necessary facilities (classrooms, laboratories, IT infrastructure, support section) for the number of students originally requested by the department. However, **the Ministry admits almost twice that number of students**, resulting in significant overcrowding of the facilities.

- There are 3 basic buildings with good capacity and great accessibility. Additionally, the use of amphitheaters external to the Department has been agreed through the appropriate university committees. A few laboratories seem to need modernization of their equipment, as far as the Department follows core technology courses and educational materials.

- There is a reasonable allocation of existing facilities with a distinct and fully delineated coverage of the areas of each Division of the Department. All of the facilities are in walking distance from the external amphitheatres and classrooms used by the Department.

- A **wide range of support services are available** to all students. For example, the e-class platform, which is an integrated Electronic Course Management System under open source philosophy, a range of open academic courses that are freely accessible and available on-line, the department's participation in Erasmus programs, the ability for internship programmes (practical training), two student residences for accommodation, catering services and career services.

- **Students are well informed** about the available services at the Department, through the information day at the beginning of their studies, the Department's website, the Secretariat announcements and the social media managed by the Department.

- **The administrative staff makes great efforts to ensure the smooth operation of the student support services**. There is also a number of staff members for the laboratories that are in close collaboration with the administrative staff and faculty members, as a potentially additional assistance.
- Some students interviewed by the Panel mentioned that books are sometimes distributed late in the semester. It appears that some core courses neither use e-class materials nor provide class notes. This is confirmed by negative ratings on the use of information and communication technologies for the needs of classes in the student questionnaires for a fraction of the courses.
- According to the students' opinions, there still seems to exist **excessive bureaucracy associated with the administration of the study programme**, and course registration is slow and occurs too late in the semester.

Panel judgement

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

Panel Recommendations

➢ The students who met with the Panel expressed dissatisfaction with some aspects of the administration of services and courses. **Secretariat might consider adjusting its opening hours** to the public/students to make sure there is sufficient time for students to cope with the complex bureaucracy associated with the programme.

➢ Alternatively, the Department may consider **fully digitizing the administration processes**, including submission of forms and digital signatures.

➢ The Department should make additional efforts to **make available and distribute course notes early** upon semester start.

➢ **Classroom quality received uniformly poor ratings in student questionnaires, likely reflecting the excessive number of students**. The Department should make additional efforts to either increase its educational capacity to the high number of students admitted each year or negotiate with the Ministry and/or other implicated authorities for a more realistic target for student admission.

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 Department has designed and implemented the necessary mechanisms for the collection, management and analysis of the information concerning the undergraduate study programme and related activities. This is done in an integrated, effective and easily accessible manner.
- Student satisfaction with their programmes is recorded through questionnaires designed by MODIP (see recommendations under Principle 9).
- The Department maintains a directory of the graduates with relevant information regarding their career paths (through questionnaires).

Panel judgement

Principle 7: Information Management	
Fully compliant	**x**
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

- An effort should be made for the **timely update of the course registration information.** For example, in some courses, registration in the course might not be open until late in the semester. As a consequence, in some cases, students have to follow two or more courses for a long period before they decide which one to declare. Consequently, the instructor learns the enrollment in his/her class close to the semester´s end.

- **Student participation in filling the questionnaires is generally very low** (at about 10% of the number of students taking final exams) and this does not allow to produce statistically significant performance indicators across all classes. An effort should be made to **encourage student participation**, for example by devoting a special "questionnaire filling" in-class pre-scheduled student-led session during which students are asked to complete the questionnaires (e.g. using their tablets or smartphones) in the absence of their teachers. In addition, students should be encouraged to provide detailed comments on the courses beyond answering the multiple choice questions.

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 **website of the Department provides ample information** on all aspects of interest to prospective and current students, graduates, other stakeholders and the public.
- The Department participates in the annual "**Patras IQ" event**. This is an excellent idea as it gives the opportunity for students to present their ideas to professionals as well as to the general public.

Panel judgement

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

Panel Recommendations

➢ The **website of the Department could be improved and made more user friendly**. For example, lengthy textual documents need not be shown up front. In particular, the website should have a standard tree-like organization, and the detailed class information should be easily accessible in a direct form from a list of classes instead of a large zip archive of doc files.

➢ Additional effort should be made to attract high school students as well as the private sector by organizing in-house or extramural events such as:
  - **Outreach activities in high schools** presenting the undergraduate studies program, i.e., half day presentations by department's teachers presenting the study content and career opportunities in Electrical and Computer Engineering.
  - **Presentations of diploma theses in 180 seconds or 3 minutes** to companies and the general public[8,9].

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[8] https://www.campusfrance.org/en/my-thesis-in-180-seconds-international-contest-s-first-prize-awarded-a-phd-student-from-burkina
[9] https://threeminutethesis.uq.edu.au/

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 Department carries out annual internal quality assessments, the reports of which are posted on the department web site[10].

- The study program underwent a significant revision as the result of the 2013 external evaluation.

- Student class evaluation questionnaire responses are shared with the respective instructors and processed by the OMEA, and average results are brought to the General Assembly.

- Textbooks are distributed to students in electronic form through the service eudoxus.gr. Eligible textbooks are selected from a comprehensive national list of textbooks, which includes textbooks originally written in Greek and in English translated into Greek.

- Students who met with the Panel expressed a feeling that the evaluation questionnaires do not lead to improvements **sufficiently quickly**. They even requested that the questionnaire results for each class be made public, something that cannot be done due to privacy concerns (of the instructor).

- Students shared with the Panel that a small number of instructors tend to mark unfairly hard (e.g. best grade in the class is a 7/10) or too easy (e.g. the majority of the class gets a 10). Inspection of the grade distributions of the 2017-2018 course offerings shared with the Panel indicates that certain classes, especially early core courses, indeed have a very high fraction of very low passing grades. Some course offerings have a very high fraction of high grades.

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[10] http://www.ece.upatras.gr/gr/evaluation-menu/int-evaluation-menu.html

- Students commented that several textbooks and course materials are very old, and some professors, especially of core courses, do not adequately use the e-class system. A detailed inspection of class materials confirmed that classes would benefit from continuous updating. The student questionnaires point to some classes that would benefit from an **update of their class notes**.

Panel judgement

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

Panel Recommendations

- It is noted that there is **no formal prerequisite structure** in the study program. The panel strongly recommends that a formal prerequisite structure be established and enforced. This may have a positive effect on the average time of completion of the degree (i.e. help shorten it).
- Students raised the issue of **course materials being outdated**. Rotating related faculty through courses by capping the number of consecutive times an instructor can teach a specific course would help with refreshing the course materials.
- Given the very low **completion rate of student class evaluation questionnaires**, concrete action should be taken to ensure higher participation, possibly by allocating some class time for the students to fill out the questionnaires in the absence of the instructor. Only approximately one third of the classes offered in the 2017-2018 academic year had more than 10 questionnaires returned by the students. The average return rate of questionnaires is approximately 10% of the students who took the final exams. The OMEA is aware of the issue and is looking into ways to improve the completion rate.
- Students complained about the **high variance in the quality of classes, as perceived by them**. An analysis of the questionnaire responses per class provided to the Panel by the Department reveals that there are indeed several classes (more than 10% of the total number of classes) with very low overall ratings (defined as less than one standard deviation below the department mean), and more classes with very low ratings in individual questions. **The extremely detailed questionnaires offer a powerful instrument for improvement of the quality of teaching**, and the Panel strongly recommends that **suitable processes** shall be put in place to make use of these questionnaires and to promote a culture of constantly improving the course materials and the delivery of classes. For example, instructors with very low ratings could be asked to submit to the OMEA a plan of what improvements they will

carry out to the course materials and the course delivery. The OMEA can follow up in subsequent years to confirm that improvements were indeed made, as reflected in the questionnaires. This will convey the message to the students that their opinion does matter, which will further improve the response rate of the questionnaires.

Principle 10: Regular External Evaluation of Undergraduate Programmes

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

HQA is responsible for administrating the programme accreditation process which is realised as an external evaluation procedure, and implemented by a committee of independent experts. HQA 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 Department **has taken serious steps to comply with the recommendations of the last external evaluation report**:
  - It maintains and even strengthens its outward looking policies (both nationally and internationally); it is to be noted here that a significant effort was made to adapt the new undergraduate study program to ECTS and to encourage a large number of students to participate in the Erasmus program.
  - It collects, evaluates and analyzes regularly the information regarding long range planning (see also Principle 1 comments);
  - It significantly improved the undergraduate study program by creating a three-year core and by introducing a general compulsory course describing the skills, ethics and goals of an electrical engineer's profession; it is to be noted here that the students expressed their satisfaction over this particular point).
- As recommended by the last evaluation panel the Department is considering the development of courses given in English so as to attract foreign students.

Panel judgement

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

Panel Recommendations

➢ The Panel had the opportunity to witness the high quality research performed by the members of the ECE Department at UoP, which also resulted in its high ranking in the QS World Ranking/Top Universities. When this Accreditation Review is completed, the Department should continue aiming higher also for the quality of its teaching at international level. The Panel strongly believes **the Department should now seek for international accreditations** of its undergraduate programme in engineering, such as the EUR-ACE label (at European level) or even the ABET accreditation (US-equivalent).

➢ **The development of courses given in English requires special attention**. Indeed, before offering such a course, the department has to make sure that:
  - all students admitted in the course, as well as the instructor of the course, have a sufficiently high level of proficiency in English;
  - the course is also given in Greek if there are Greek students interested in the course but cannot be admitted in its English version.

PART C: CONCLUSIONS

I.   Features of Good Practice

- There is a good functioning and cooperation between MODIP and OMEA.
- Adequate implementation of the data collection mechanisms for survey-based student satisfaction quality assurance is in place.
- There is full compliance with the recommendations of the 2013 External Evaluation Report.
- An International Advisory Board has been properly established.
- A mentoring scheme has been implemented for incoming students.
- There was an early implementation of ECTS and an adequate adoption of best practices for student-centered learning.
- The Department makes an efficient use of high quality teaching assistance by doctoral students.
- The Introductory course in the Science of Electrical Engineering is an appropriate and very successful initiative.
- There is strong support to students interested in practical training.
- The Department has established high standards for the Diploma Theses. The final thesis documents are published online through the Nemertes web service.
- The adoption of teaching methodologies based on virtual classroom platform (e-class).
- There are strong ties with the private and public sectors in the region, and good links with graduates, who maintain their e-mail @upatras.gr for life.
- The Department´s active involvement in extramural events, such as Patras IQ, is quite strong.

II.   Areas of Weakness

- The active participation of students in the development of the undergraduate programme is insufficient.
- The number of students admitted in the programme by the Ministry each year is significantly higher than the one the Department´s infrastructure and teaching capacity can handle in an effective way.
- The results of student questionnaires to continuous improvement of quality of teaching and course materials are not analysed to a sufficient depth and detail.
- There is lack of instructor rotation after a limited number of consecutive teaching assignments of an instructor to the course.
- There is uniform teaching load to all teaching staff regardless of research productivity and graduate student supervision.
- Research and teaching links with the Computer Engineering and Informatics Department are weak.

III. Recommendations for Follow-up Actions

- Consider the establishment of an industrial advisory board.
- Seriously consider new courses (core or electives) or new learning outcomes to existing ones that train students in transversal competences ("soft skills"), for example by emphasizing group projects.
- Consider the establishment of a rotational scheme in assigning instructors to courses, in a way to promote their modernization as well as to increase the quality of teaching and the curricula of the teaching staff.
- Consider the organization of events such as Career Days or visits to facilities with relevant infrastructure at companies, institutions or other organizations in the region.
- Further promote the wider use of e-class at all levels within the study programme.
- Consider the establishment and enforcement of clear prerequisites within the study programme.
- Perform a deeper reflection on the concept of student-centered learning and implement it in a more profound way in the new study programme.
- Improve procedures for submission and handling of student complaints.
- Improve the Departmental website, create a complete version of it in English and simplify the navigation and access to information, particularly to individual course outlines.
- Consider fully digitizing the administration processes, including submission of forms and digital signatures.
- Additional efforts should be made to ensure the timely delivery of books and other study material to students in the beginning of each course.
- Promote closer collaboration schemes in both teaching and research with the Computer Engineering and Informatics Department at UoP, possibly through course sharing and horizontal research actions.
- Establish a strategic research plan for future activities of the Department, which should guide future faculty position openings and would also promote the continuous improvement of the study programme.
- Establish a mechanism of assessment of the quality of teaching at individual level, using feedback gathered by the OMEA from the student surveys, and devise ways to implement a continuous improvement scheme for teaching.
- Promote actions to improve students' participation in class evaluation questionnaires.
- Consider the possibility to apply for European (EUR-ACE) or even American (ABET) accreditations of the undergraduate programme.

IV. Summary & Overall Assessment

The Principles where full compliance has been achieved are: 1, 2, 4, 5, 6, 7, 8, and 10

The Principles where substantial compliance has been achieved are: 3, 9

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 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 Accreditation Panel for the UGP of Electrical and Computer Engineering (Integrated Master) of the University of Patras

Name and Surname   **Signature**

- Prof. **Georgios Kontaxakis** (Chair)
  Universidad Politécnica de Madrid, Spain

- Prof. Emeritus **Nikolas Spyratos**
  Université Paris-Sud XI & CNRS, Paris, France

- Prof. **Evangelos E. Milios**
  Dalhousie University, Halifax, Canada

- Mr. **Sotiris Michalopoulos**
  Technical Chamber of Greece, Greece