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HELLENIC REPUBLIC

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Accreditation Report

for the Undergraduate Study Programme of:

Computer Science and Biomedical Informatics

Institution: University of Thessaly

Date: 11 July 2020

Ευρωπαϊκή Ένωση
Ευρωπαϊκό Κοινωνικό Ταμείο

Επιχειρησιακό Πρόγραμμα
Ανάπτυξη Ανθρώπινου Δυναμικού,
Εκπαίδευση και Διά Βίου Μάθηση
Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης

ΕΣΠΑ 2014-2020

enqa.

Report of the Panel appointed by the HAHE to undertake the review of the Undergraduate Study Programme of **Computer Science and Biomedical Informatics** of the **University of Thessaly** for the purposes of granting accreditation

TABLE OF CONTENTS

Part A: Background and Context of the Review 4

I. The External Evaluation & Accreditation Panel 4

II. Review Procedure and Documentation 5

III. Study Programme Profile 8

Part B: Compliance with the Principles 10

Principle 1: Academic Unit Policy for Quality Assurance 10

Principle 2: Design and Approval of Programmes 13

Principle 3: Student-centred Learning, Teaching and Assessment 15

Principle 4: Student Admission, Progression, Recognition and Certification 18

Principle 5: Teaching Staff 20

Principle 6: Learning Resources and Student Support 23

Principle 7: Information Management 26

Principle 8: Public Information 29

Principle 9: On-going Monitoring and Periodic Internal Review of Programmes 31

Principle 10: Regular External Evaluation of Undergraduate Programmes 33

Part C: Conclusions 35

I. Features of Good Practice 35

II. Areas of Weakness 36

III. Recommendations for Follow-up Actions 37

IV. Summary & Overall Assessment 38

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 of **Computer Science and Biomedical Informatics** of the **University of Thessaly** comprised the following five (5) members, drawn from the HAHE Register, in accordance with Laws 4009/2011 & 4653/2020:

1. **Prof. Emeritus Spyridon Agathos** (Chair), Université Catholique de Louvain, Louvain-la-Neuve, Belgium
2. **Prof. Nikolaos Bourbakis,** Wright State University, Dayton, OH, USA
3. **Dr. Haralambos Hatzakis,** Biotronics3D Ltd, London, UK
4. **Prof. Constantinos Pattichis,** University of Cyprus, Nicosia, Cyprus
5. **Dr. Sophia Tsoka,** Reader, King's College London, London, UK

II. Review Procedure and Documentation

The Hellenic Authority for Higher Education (HAHE) formed an external and independent panel of experts to conduct an assessment of the compliance of the study programme of the Computer Science and Biomedical Informatics (CSBI) Department of the University of Thessaly (UTH) in accordance with the HAHE Quality Assurance requirements (laws 4009/2011 & 4653/2020). The assessment was conducted through document reviews and online interviews. The method used was an evidence-based process centred on sampling of the Department's activities and it was aimed at evaluating the fulfilment of the HAHE requirements of the relevant Quality Standard of the Study Programme and commenting on its compliance, effectiveness and applicability for the scope of the requirements. The information provided by the Department was assumed to be factually correct.

Due to the unprecedented circumstances of the Covid-19 pandemic, the entire evaluation and accreditation exercise did not include a site visit of the Department and University campus in Lamia but was carried out remotely using the Zoom platform.

On June 26, 2020 the External Evaluation and Accreditation Panel (AP) received from HAHE the Accreditation support material from the HAHE Cloud link https://docs.ethaae.gr/s/kwPjWSmgzFNnboX which contained the following:

1. Computer Science and Biomedical Informatics (CSBI) Department of University of Thessaly (UTH) Material, consisting of the documents:
    - B1. Proposal of Academic Accreditation
    - B2. Quality Policy of Undergraduate Study Programme
    - B3. Study Guide
    - B4. Regulation of Undergraduate Study Program and Other Regulations
    - B5. Course Outlines
    - B6. Quality Targeting
    - B7. Questionnaires to Students for Course Evaluation and Results
    - B8. Results of Internal Evaluation
    - B9. Quality Data (comprising miscellaneous statistical data on the Undergraduate Study Programme and referring to the reports for the years 2015, 2016, 2017 and 2018)
    - B10. Additional Documentation Material – 1 Citations to publications of faculty members and 2- Annual Reports of Internal Evaluations 2014-2018.

2. HAHE material, containing the documents:
    - Accreditation Guide
    - P1. Standards for Quality Accreditation Programme
    - P12a. Guidelines for the Accreditation Panel
    - P13. Mapping Grid
    - P14. Template for the Accreditation Report
    - Quality Indicators Dept Comp Sci & Biom Infor 2015-2016
    - Quality Indicators_Dept Comp Sci & Biom Infor 2015-2016
    - Quality Indicators_Dept Comp Sci & Biom Infor 2015-2016
    - Quality Indicators_Undergrad Progr Comp Sci & Biom Infor 2015-2016

- Quality Indicators_Undergrad Progr Comp Sci & Biom Infor 2016-2017
- Quality Indicators_Undergrad Progr Comp Sci & Biom Infor 2017-2018
- External Eval Report, Univ Thessaly (ex- Univ Central Greece) CSBI, 2011

In addition, at the Panel's request, the Department and internal Evaluation Group (OMEA) set up a website for the accreditation process (http://accreditation.dib.uth.gr/) where they uploaded, upon request, missing or not readily available material (tab "EXTRA MATERIAL REQUESTED").

On Tuesday June 30, 2020 at 18:00 (Athens time), an orientation meeting via Zoom was organized by HAHE's Director General Dr. Christina Besta addressing the procedures to be followed during the virtual site visit and subsequent report drafting. During this meeting a thorough presentation was made on the quality assurance (QA) mission and guidelines of the accreditation process were given.

In view of getting to know each other and establishing a modus operandi regarding the exercise of accreditation, the EEAP members met virtually on Monday July 6, 2020 at 14:00. The EEAP Review of the CSBI Undergraduate Programme (UP) started formally at 15:00 via Zoom.

In the first part of this virtual meeting, the UTH Vice-rector and president of MODIP Prof. I. Theodorakis and the Dean of the newly established School of Sciences in the Lamia campus and OMEA member Prof. P. Bagos familiarised the panel with UTH (facts and figures). Next, the CSIB Department Chair and OMEA member Assoc. Prof. I. Anagnostopoulos gave an overview of the UP's origins, evolution and current status. The different aspects of compliance with the accreditation principles (A1-A10) were presented by key members of the Department, including the Chair, OMEA representatives Assoc. Prof. D. Iakovidis, Prof. P. Bagos, Assist. Prof. A. Kakarountas; and MODIP representative Prof. D. Vavougios. The EEAP subsequently met with faculty members selected by the Department that included one Professor (A. Hatzigeorgiou), three Associate Professors (H. Sandalidis, K. Delimpassis, E. Markou), four Assistant Professors (V. Drakopoulos, T. Tzouramanis, I. Triantafyllou, G. Braliou) as well as one Lecturer (H. Karanikas). Finally, the EEAP met with 6 undergraduate students (V. Fili and G. Tsionkis, 2nd year; A. Bitsakou, F. Melissari, R. Iatroudi, 3rd year; G. Vangelatos, 4th year).

On the next day, July 7, 2020, starting at 15:00 an on-line tour of the Department's facilities was presented to the EEAP via a prerecorded video of classrooms, amphitheaters, laboratories, offices and service facilities (https://youtu.be/febg4HmSEUY). The virtual site visit was narrated by Assoc. Prof. M. Adam and additional discussions on the facilities were carried out with EDIP members Drs. G. Spathoulas and A. Vavoulas, ETEP member P. Karageorgos, Instructor Dr. P. Kontou and Administrative staff members D. Zygouri and D. Bilali.

The next virtual meeting was between the EEAP members and six alumni of the CSBI UP spanning over a decade, who work in various industries and universities (E. Arvaniti-Koutsiana, Hilti Befestigungstechnik AG, Switzerland; G. Soursou, Marie Skłodowska-Curie PhD Fellow at University of Cyprus & Early Stage Researcher at Center for Applied Neuroscience, Cyprus; C. Papadimitriou, Tessara Therapeutics Pty Ltd., Australia; S. Mouratidis, Sony Depthsensing Solutions, Belgium; E. Doutsi, Postdoctoral Fellow at Signal Processing Lab (SPL)/Institute of Computer Science (ICS)/Foundation for Research and Technology - Hellas (FORTH); E. Kritsinioti, AKKA GmbH & Co. KGaA, Germany). This was followed by a teleconference with six social partners and employers (T. Heimaras, Hellenic Parliament; A. Pontika and D. Kyritsis, Vice-Mayors

of Lamia; K. Vardakostas, Region of Central Greece; G. Zardas, Fthiotida Chamber of Commerce and Industry; and T. Zikas, Epihirin S.A.).

Lastly, the Panel provided an overview of their preliminary impressions and assessment of the CSBI UP to the Vice-Rector of UTH Prof. I. Theodorakis, the Chair of the Department Assoc. Prof. I. Anagnostopoulos, and representatives of MODIP (Prof. D. Vavougios) and OMEA (Prof. P. Bagos, Assoc. Prof. D. Iakovidis, Assist. Prof. A. Kakarountas) and discussed their major findings and recommendations. The meeting concluded at 19:30.

After the first two days of virtual meetings, the EEAP recognized a very positive atmosphere and a willingness of the Department officials to cooperate and support the University's QA policy at all levels with a commitment to maintaining and further upgrading the quality standards of UTH in compliance with HAHE. Furthermore, the Panel appreciated the Department's efficient contribution of all requested additional documentation in the dedicated website. Hence, the EEAP would like to thank the Department and University Administration as well as all faculty members for their cooperation and fruitful discussions.

During the following four days (8 to 11 July 2020), the EEAP members had several remote meetings for the completion of the draft Accreditation Report (AR).

III. Study Programme Profile

The Department of CSBI is part of the School of Sciences of the UTH and is located in the University's Lamia campus. It was founded in 2004 as part of the then University of Central Greece and accepted its first undergraduate students in the academic year 2004-2005. The Department became part of the UTH in 2013. It has a distinctive profile among Greek academic units of applied sciences as it combines a range of areas in the field of Informatics and in the field of Biomedical applications in a single degree programme. Because of this, the students receive a rigorous background in Information Technology as well as in the development of Health Information Systems and software for applications ranging from computational Biology to data management and organization of Medical units and research in Biomedical Technology and Bioinformatics.

The Department follows a trajectory of academic growth as evidenced by the increasing number of high-impact scientific research publications and an active participation in both European and nationally funded research programs. The students graduating from the CSBI UG programme are successful in the labor market, as they can work in the public or private sector or, alternatively, in the pursuit of postgraduate studies in Greece and abroad. Additionally, the Department has an award-winning IEEE Student Branch. A further career outlet for students is in Pedagogical and Teaching Competence, upon completion of a course approved by the Greek Educational Policy Institute. The Department of CSBI offers an inter-departmental postgraduate programme in Informatics and Computational Biomedicine, doctoral studies, as well as post-doctoral research in all the above-mentioned fields.

The Department is located in two buildings, the original Building A (former Academy of Lamia) and the newly acquired Building B (former TEI of Lamia) and accepts approximately 200 undergraduate students annually. It offers modern, high-quality education with a four-year (8 semesters, 240 ECTS units) UG degree programme. The Department of CSBI is composed of 17 faculty members (3 Professors, 6 Associate Professors and 8 Assistant Professors) plus 1 permanent Lecturer, 5 laboratory teaching staff (EDIP), 4 technical staff (ETEP) and 8 contractual teaching staff. In addition to their teaching duties, the faculty are engaged in scientific research and outreach services to society, with a growing record of scientific accomplishments, increasing external collaborations in Greece and abroad, and competitive external funding. These aspects attest to the continuous development and recognition of the Department.

The average UG degree grade of CSBI graduates is 6.5/10.

The two CSBI Department buildings have fairly adequate facilities, including well-equipped laboratories and functional classrooms with sufficient space, uncharacteristically clean without graffiti or littering. The office space for faculty members is borderline (not all faculty and teaching / lab / technical staff have individual offices). The office space dedicated to the PhD candidates is totally inadequate. The EEAP found that the absence of a reliable bus connection between the two buildings is a real problem that requires an urgent solution. There are no residence halls and no subsidized food catering (σίτιση) for students.

The Department is determined to strengthen its links to the society, both in the Province of Central Greece and that of Thessaly. To this effect it promotes consulting services by its research and teaching staff and volunteer activities to social organizations and public awareness events. In addition, it is organising its alumni through a dedicated LinkedIn group

and it encourages its students to participate in a number of scientific and social events, talent competitions ('hackathons'), entrepreneurship-promoting initiatives, etc., as a way to help develop a culture of innovation among its students and future professionals.

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 Department implements a Quality Assurance policy in line with that of the University and the European and the National Qualification Framework for HE, aiming at the continuous improvement of the programme. This Quality policy focuses and it is built on six pillars: the continuous improvement of its quality indicators, the creation of a working environment with incentives for the Faculty, the establishment of motivational strategies for students and

employees, the implementation of multidisciplinary actions leading to a more competitive position for new recruits (students and academics), actions leading to the inclusion of the Unit in global relevant academic lists of excellence and the creation of an environment which promotes and rewards excellence.

Through the Policy statement (Politiki_Poiothtas_TPEB3894) the Department is committed to continuous improvement of a Quality Policy that supports the academic profile and orientation of the curriculum, and supports the students and the Faculty. Through the policy it promotes the quality and effectiveness of teaching, the appropriateness of the qualifications of the teaching staff, the enhancement of the quality and the quantity of the research outputs, the link between research and teaching, the quality of supporting services, and the conduct of the annual review and internal audits. The Quality Policy is uploaded on the website and is accessible to all the stakeholders.

The Department has instituted at the latest Council Meeting (Συνέλευση Τμήματος) on the 12/9/19 two Committees relevant to Quality Assurance and Assessment (Committee for Internal audit and Committee for assisting the internal audit) (Epitropes_2019_2020).

It is notable that the Department performed a SWOT analysis (12/2/20) as part of its Internal Quality Assessment to assist with the positioning of the Department in the Local and International Academic community within the Quality Strategy. This analysis is deemed to be accurate and effective and is expected to be used as input for the ongoing improvement of the Quality System.

There is a Quality Manual which describes and establishes the following procedures:

- Procedure for the revision or restructuring of the curriculum
- Procedure for the internal quality audit
- Procedure for the quality assurance for the research output of the Faculty
- Procedure for monitoring the quality of the qualifications of the teaching Faculty.
- Procedure for the information and communication of the Department's Quality Policy to the Academic and Administrative personnel.
- A set of procedures related to the Erasmus+ programme
- A set of procedures related to administrative tasks and actions.

Each procedure defines its purpose, the references and the steps to be performed. However, most of them lack definition of inputs and outputs, responsibilities and performance measures for the procedure.

The EEAP performed random sampling of the implementation of the first 2 procedures and the Department provided the appropriate and adequate documented evidence when requested.

The Quality Policy defines 6 objectives for the period 2019-2022 with the relevant KPIs which the EEAP considers fit for purpose and very relevant to the strategic orientation of the Quality Policy. KPIs are recorded and presented, however there was no evidence of further analysis of those KPIs.

Finally, the EEAP verified the compliance of the programme and the Department with the template's requirements. Moreover, the EEAP was very pleased to audit the Department's

Quality System, which is proven to be not only fit for purpose opening new perspectives towards the international standing of the awarded degrees, but there was enough evidence that the Quality System is actively used for the continuous improvement across all 6 strategic objectives.

Panel Judgement

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

Panel Recommendations

- The EEAP recommends the designation of a single Committee responsible for maintaining the Quality System of the Department (e.g., the OMEA). As part of its remit, this Committee should update the list of procedures according to new legislation and the new requirements, own the implementation of each procedure, institute internal audits and in general make sure that the Quality Management System is fit for purpose. This Committee should replace the 2 other Committees for internal audits.

- The EEAP recommends that the agenda of the annual Department Council Meeting also include the analysis of the KPI measurements reflecting upon the findings which in turn should create input to concrete actions for the ongoing improvement of the Department and its operations.

- The EEAP was satisfied with the existence of a set of documented procedures, describing how the key operations of the Department should be performed and controlled. The EEAP recommends that the procedures be extended to also describe inputs and outputs (very often given in relevant diagrams). Also, those procedures should be part of a controlled set of documents (with version numbers, revisions and document history).

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 institutional procedure is followed by the Department for the programme design. This has been demonstrated by the presentations of the Departmental Chair and the OMEA and MODIP representatives. Based on the self-assessment procedures and the information submitted by all teaching staff to the MODIP system, OMEA compiles the annual report («ΕΤΗΣΙΑ ΕΚΘΕΣΗ») and provides valuable and comparable insights in respect to previous years.

Students actively participate in shaping the programme changes. Student representatives are invited to participate in the General Assembly, providing their opinion as far as the design and approval of the UP. Their opinion and comments are reflected through the course evaluation procedure, where the students participate for every course of the programme and across all semesters in a systematic way.

External stakeholders are involved in shaping the programme changes.

About the smooth progression of students throughout the stages of the programme, the Department reported three numbers regarding the monitoring of students: (i) number of students enrolled in the course of studies (N=504 in 2018), (ii) number of students enrolled in v+2 years (N=724) and (iii) number of students enrolled exceeding v+2 years (N=225 in 2018). There is a need to set up procedures for better monitoring the progression of students in the course of their studies.

The anticipated student workload is clearly documented according to ECTS. The course content is organized in 8 semesters as follows: 28 compulsory courses (21 computer science and 7 biomedical), 14 required elective courses (from a pool of 21 courses in eHealth and bioinformatics and 27 courses in computer science) and 4 free elective courses.

As far as providing work experience to the students, the internship option is included in the course of studies as a free elective of 4 ECTS units. It is noted that this is optional at present. The Department should further encourage the uptake of the internship option.

The Department is actively linking its teaching and research activities mainly through the final year project and the teaching of the elective courses. The impact of this is demonstrated via the significant number of joint (faculty members and students) publications in both journals and conferences.

The Department follows the relevant regulatory framework for the approval of the programme by the institution.

Panel Judgement

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

Panel Recommendations

- In an effort to provide more feedback to faculty members, to better monitor students in the course of their studies (it is recognized that this is a difficult task and it could be based on yearly ECTS coverage).
- To diminish the number of students enrolled exceeding v+2 years.
- To consider decreasing the number of courses and consolidate them in the course of studies.
- To consider introducing the course prerequisite concept.
- To increase the number of students carrying out the internship option.
- The external input to the shaping of the UP curriculum should be increased and be more structured (e.g. by an External Advisory Board involving relevant stakeholders, or an External Entrepreneurs-in-Residence programme, etc.).

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 curriculum that represents the collective set of courses taught by the UP of the CSBI at UTH includes a wide range of scientific disciplines, and spans computer science, mathematics, biology, medicine and their interfaces. The subjects taught are appropriate to providing students with background relevant to the domain. Teaching covers both theory (through lectures) as well as application (through compulsory lab sessions and tutorials).

We note the extensive number of optional modules in the curriculum that allows students in years 3 and 4 to specialises according to their own aspirations and preferred career path.

Students are well-informed of the choices available to them through the online available Study Guide and are encouraged to follow individualised and flexible training through a diploma thesis research project (optional) and practical training internship (also optional).

The EEAP notes that student intake is variable, with parts of the student cohort coming from health-related high school options (and therefore limited exposure to advanced mathematics) or mathematics-related options (where biology is not taught). Currently, curriculum design in the first year does not reflect this fact and it may be considered that the first-year core module diet should be designed to reflect student background, as indicated in the recommendations below.

The EEAP acknowledges regular annual meetings for internal evaluation, where the curriculum is discussed and potentially adjusted. Also noted is student surveys being carried out for each academic module in a regular, detailed and transparent manner.

With regards to assessment, criteria are well defined and made available to students. In accordance to assessment procedures in Hellenic Universities, the assessment is entirely driven by the course lecturer without other input (internal or external) on setting the questions, or error and consistency checks of the exam paper and the examination results. Although such procedure may not reflect best practice in terms of setting appropriate scrutiny mechanisms in place, the EEAP accepts the procedures that most Hellenic academic institutions adhere to. However, the EEAP recommends a light-touch examination of exam results, where basic statistical analysis is presented to the internal evaluation committee (OMEA) of the Department after each exam period for appropriate discussion and ratification.

A document for examination procedures was made available to the AP, in which processes in relation to how mitigating circumstances are reported and processed is not included. Similarly, a procedure for student complaints and appeals is not published.

The EEAP notes that first year students are suitably welcomed to the activities of the Department by academic, as well as professional services staff. Across all year cohorts, students, academics and administration staff have stressed particularly close interactions between them, ensuring suitable support to student learning and underlying mutual respect.

Panel Judgement

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

Panel Recommendations

- The EEAP recommends that the Department consider minimal curriculum change where, rather than all first-year students attending the same core modules, students with mathematical background have biology as core module (rather than maths) and students

with biology background take maths (and not basic biology modules). This would result in a more flexible approach to learning, would allow students to focus on areas where they should improve and would alleviate excessive student numbers in some basic modules.

- The EEAP recommends that examination results of the preceding academic year are reported and discussed by the OMEA with a view to making suitable adjustments to the summative process, e.g. introduce coursework as part of the assessment, or post-processing of the exam results through mark mapping to ensure consistency between cohorts or different modules of the same cohort.
- A procedure for student appeals and reporting mitigating circumstances in relation to assessment should be established.
- The EEAP recommends that OMEA consider state-of-the-art programming and statistical scripting languages with emphasis on open-source tools.

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

With regards to student admission, it is evident that the closely-knit structure of the Department favours student support of first-year students during the induction stages and beyond. As evidenced through comments by past and present students, as well as academic and professional staff, there is close collaboration by all parties, which facilitates smooth transition into university education initially, and exploring individual academic interests and career paths subsequently.

Student progression is facilitated by the assignment of an academic member of staff as advisor to each student that acts as instructor as well as providing pastoral care. Each student is provided with a personalised record (φάκελος) to summarise and document progression particulars. The EEAP also notes that there is an excessive number of students that do not graduate with an acceptable duration (v+2), which places considerable strain on resources. Finally, the EEAP comments on the low diploma grade point average (GPA) achieved by the students graduating from the Department.

Student mobility through the Erasmus+ program is managed well, with specific and adequate criteria to evaluate the suitability of student placement through the programme. Transparency of the selection process is guaranteed through appropriately detailed written documentation. The EEAP believes that the activities of the mobility program would benefit from dedicated administration support.

ECTS is applied throughout the curriculum and the Diploma Supplement is issued to students in Greek and English.

Practical training internship is in place and is supported well through (i) extensive documentation of the procedure that each student should follow and (ii) how the allocation of student to the host is determined. Importantly, according to accounts by students, practical training is

important in honing their individual skills and shaping their career aspirations. The EEAP believes that further details of external stakeholders with regards to these internships should be compiled and appropriately documented. Such documentation would facilitate the continuous improvement of links with stakeholders in the private and public sector and would contribute to enhancing the visibility of the Department through this scheme.

Panel Judgement

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

Panel Recommendations

- The EEAP recommends that OMEA consider appropriate procedures to reduce the number of students that do not graduate in good time.
- With regards to relatively low diploma GPA achieved by the students graduating from the Department, the EEAP recommends internal procedures to evaluate assessment (see recommendation in Principle 3), so as to ensure an acceptable distribution of marks across each student cohort.
- The EEAP recommends recognition of student excellence through prizes in each student cohort.
- The EEAP recommends dedicated administration support to the Erasmus+ committee.
- The EEAP recommends documenting external stakeholders and internship opportunities with a view to expanding the spectrum of available outputs and increasing the external visibility of the Department.

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

Clear and transparent procedures are followed for the recruitment of new staff. At present, there are 18 faculty members (3 Full Professors, 6 Associate professors, 8 Assistant Professors and 1 Lecturer). The number of faculty members increased steadily in the last years, compared to 14 faculty members (5 Associate Professors and 9 Assistant Professors) in 2017-2018 and 11 faculty members (3 Associate professors, 7 Assistant professors and 1 Lecturer) in 2014-2015. Moreover, there are two open positions, one in Robotic Systems and one in Internet of Things at the level of Assistant Professor. Both of these topics are state-of-the-art and complement the existing expertise of the Department.

It is noted that the annual gross salary package for the recruitment of new teaching staff is not at all competitive (certainly, this is the case for all Hellenic universities).
The student – staff (faculty member) ratio is quite high when taking into consideration the number of students studying in the course of their 4 years of studies (no. of students = 504 in 2018) which becomes even worse when adding the number of students of 4+2 years (no. of students = 797 in 2018) without considering the 'stagnant' students.

Regarding opportunities to promote the professional development of the teaching staff, unfortunately, due to the limited number of faculty members, there was no possibility of sabbatical leave. The situation is better now but the hiring of more faculty members is needed.
There is a need for the establishment of even small starting grants, also including the purchase of equipment.

Moreover, there is a need to establish collaborative grants of the Department with the Medical School, the hospitals and the industry.

Regarding scholarly activity to strengthen the link between education and research, this is carried out successfully by the faculty members, especially via final year diploma projects. This is demonstrated via the publication of journal and conference papers by the faculty members jointly with students and the Department is to be congratulated for this.

Regarding innovation in teaching methods and the use of new technologies, the recent situation with the pandemic triggered the exploitation of new technologies in teaching for the whole staff that was carried out successfully.

Regarding the promotion of increased volume and quality of research productivity, it is noted that the research output of the faculty members for 2018 was 45 journal papers and 47 conference papers, whereas the Google Scholar citations for the same year was 3382 (versus 3107 for 2019). In 2017, the number of journal publications per faculty member ranged between a minimum of 0 and a maximum of 9. There was no analogous information regarding refereed international conference papers. The average number of citations per faculty member has been in the region of 110 since 2015. Moreover, according to SCOPUS, in 2019 the total citations and h-index among the faculty members ranged from 71 to 13022 and from 5 to 42, respectively.
The total research funding of the Department in the last decade has been in the region of 5.5 million Euro whereas the ongoing research funding is close to 3 million Euro. Most of the funding sources are national.

Regarding the following of quality assurance processes for all staff members, it is noted that the selection and promotion of the teaching staff follows the procedures of Greek legislation like most Greek universities. Transparent procedures are followed for the recruitment of staff and on targeting high-demand fields that involve cutting-edge technologies.

The “APELLA” system is used for tracking selection committee experts and to follow and monitor the recruitment procedures.

The teaching staff tries to bring a research culture to the classroom, and this is evidenced by a high number of publications having undergraduate students as co-authors. Teaching staff is encouraged to participate in the process of defining the research strategy of the Department, as most of the teaching staff has joined one of the 4 research labs.

As far as teaching is concerned the load of teaching and research staff (DEP) is close to 6-8 hours per week, which has been significantly improved in the last 5 years.

Students evaluate all teaching staff across several categories (effectiveness, behaviour, timeliness, etc.) as well as across the content of the courses. Participation in evaluation seems to increase during the last years. In parallel, all teaching staff participate in self-assessment procedures by submitting relevant electronic questionnaires (MODIP system) on an annual basis. This helps the OMEA to provide valuable and comparable insights through annual reports.

Evaluation results along with respective comments per course are returned to the instructors in confidence, in order to fine-tune teaching performance and/or course content. The results of the students’ evaluation are also used during the promotion phase of the teaching and research staff members (DEP).

Regarding the development of policies to attract highly qualified academic staff, there is no evidence of an active policy to attract highly qualified academic staff (e.g. reduced teaching load; start-up funding for new recruits) due to the central control of such processes by the Ministry of Education.

Panel Judgement

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

Panel Recommendations

- To offer a more attractive annual gross salary package for the academic positions (Assistant Professor, Associate Professor and Professor).
- To hire more faculty members in an effort to lower the student - staff (faculty) ratio which at present is more than double the one found in more EU countries (see for example the situation in UK Universities https://www.university-list.net/uk/rank/univ-8089.htm).
- To establish small starting grants, also including the purchase of equipment as well as a reduced teaching and administrative load for newly hired faculty members, in order to promote the launching of their research activities.
- To establish collaborative grants of the Department with the Medical School, the hospitals and the industry.
- To hire more administrative personnel, including personnel in support of the administrative component of research projects.
- To reduce the bureaucracy associated with project management and personnel hiring.
- To develop efficient policies to attract highly qualified academic staff members.
- To pursue more aggressively the funding opportunities offered by the EU, such as Horizon2020 and similar, in partnership with established research centers. One possible mechanism of establishing such partnerships could be the organisation and hosting of prestigious and recurring conference series, summer schools, etc.
- Course evaluation by the students should be made compulsory (as this is the best practice in many Universities).

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

It is a standard policy in Greece that funding to Universities is directly coming from the Ministry of Education and Religious Affairs. Thus, each University makes the distribution of its funding to the Departments according to their needs.

In the last few years TEIs have been embedded into Public Universities structure. This integration has created more problems than benefits. The levels of knowledge and expertise are different and for some time the Departments and the Universities at large will face adjustability issues.

Under the existing conditions, the CSBI Department continues its journey for a better future. Thus, the CSBI Department's learning and academic activities with respect to facilities (libraries, study rooms, educational and scientific equipment, information and communications services) are adequate for now. The Department Chair, the Faculty and the staff have put a tremendous effort to make this unit satisfactorily operational for the current needs. However, in the near future, problems will appear due to increased number of students in the same facilities:

- For instance, there are classrooms with capacity of 50-100 and 200-250 seats to accommodate lectures for large numbers of students, however a few lectures (i.e. numerical analysis) serve near 400 students and face difficulties for effective teaching.
- There is a general concern that the large size lectures create issues that may discourage some students from regularly attending them. Thus, the learning potential of the absentee students will be in jeopardy, especially the student-centred learning. Also, if the

number of student-attendees will be increased then these facilities will not be sufficient to appropriately serve the teaching and learning efforts.

- In the CSBI Department there are four major labs and two in preparation to serve experimental studies. However, due to the subject of study and the increased number of students, the Department needs more lab space. Also, the working space is not sufficient under the current conditions. For instance, there are offices that host 2-3 instructors/professors each. This situation makes difficult their functions. In addition, the PhD graduate students have limited working space (56 PhD candidates in a small space with few desks).
- The majority of the classrooms are in one location. However, a small number of classrooms is in a different location (6 km from the main campus) that makes difficult for the students to commute in time, since there is no regular bus service for transportation.

The students are regularly informed about the available services via paper and electronic means. These services are available and accessible to typical students. The Department offers E-Class capabilities (eclass.uth.gr). There is an indication that services will be done electronically next year. There is also an academic advisor for assisting students in various academic issues.

The academic advisor's responsibilities are mainly focused on the students' academic activities (Studies Guide 2019-2020, p. 16) and limited or non-existent for collecting and offering services relevant to local jobs availability and informing the local industry about students' potential.

At the University level, there is a web site (http://prosvasi.uth.gr/) with general information and services for people with special needs (AMEA). The services to students in need are based on the assistance of other typical people (students, staff). However, it was difficult for the EEAP to personally observe if the facilities have accessibility (ramps, sensor-based opening doors, etc.) to people with special mobility needs.

It is, nonetheless, very encouraging and visible for the EEAP to recognize the efforts and dedication of the administrators, professors, instructors and staff to make the Department a successful and competitive unit.

Panel Judgement

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

Panel Recommendations

- There is an **urgent** need for autonomous and independently accessible infrastructure and services for the people with special needs (AMEA).

- There are cases where students and faculty have received outstanding awards from international competitions. The Department and the University have the responsibility to make them visible at the national and international levels.

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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

UTH is the third largest University in Greece. The Department of CSBI is unique for its kind in Greece. Thus, CSBI's internal evaluation group (OMEA) has the responsibility for the Department to develop and implement procedures and policies for improving and maintaining its smooth operation by collecting, analyzing data and feeding back for quality assurance.

In particular,

The key documents for the students' compliance with the formalities of their educational programme are easily found on the website (Services/Secretariat/Documents). These include many modern and up-to-date electronic services, such as Electronic Secretariat, E-class (see below), Academic ID Card, internet "unistudent" application, EUDOXOS (system of free textbook distribution), ATLAS (student practical internship) etc. An exceptionally useful application is the LinkedIn Alumni Group that ensures the information flow and active interaction between alumni and students in view of career prospects, possibilities of internship placements, etc. This initiative makes a systematic effort to register quantitative data on career outlets, including postgraduate and doctoral studies.

Regarding key performance indicators,

- It is very important to mention that the Department has established procedures and adjustable mechanisms for annually collecting data (electronically) for improving its overall operation regarding the student body, teaching methods, student progression, visibility-employability and career paths of graduates.
- The Department uses annual review forms and teaching evaluation forms to assess its performance. The faculty is in close interactions with students solving problems and offering constructive advice.
- The senior faculty supports and advises the junior staff members through friendly informal discussions for improving evaluations on teaching and mentoring. The Department publishes the collected data annually.

Regarding the student population profile and career paths of graduates, the incoming students' profile varies in most of the public universities around the globe. Thus, the CSBI Department is not an exception. However, the exceptional performance of the dedicated students, who have graduated from the CSBI, is clearly notable. In particular, there are several students with successful international careers in well-known institutions abroad (e.g., Hilti Befestigungstechnik AG, Switzerland; University of Cyprus & Center for Applied Neuroscience, Cyprus; Tessara Therapeutics Pty Ltd., Australia; Sony Depthsensing Solutions, Belgium; AKKA GmbH & Co. KGaA, Germany, etc.).

Regarding student progression, success and drop-out rates, there is no strict institutionalised requirement for the orderly progression of students through their courses based on prerequisites and successful completion of background material, due to the unclear regulations of the Ministry of Education. According to Departmental data, the average drop-out rate is 18 students per year and the average rate of leaving the CSBI programme for other institutions (μετεγγραφές) is 36 students per year. The way of selecting a sequence of courses towards graduation is challenging. Thus, for such cases, there is an academic advisor and the CSBI professors who offer their mentorship. The clearest rules concern only some aspects of the programme, such as the permission of students in the 7th or 8th semester to start a Diploma thesis after having successfully completed 28 courses, the permission of students to do a practical internship after having succeeded in at least 50% of the mandatory courses up to their preceding year of studies and the permission to participate in Erasmus+ after having completed the 2nd year of their study and succeeded in at least 12 courses with a grade of 6/10 or higher. In addition, the eClass option gives to the Department the advantage of real-time processing sharing information with students.

Regarding student satisfaction with their programme, the EEAP has noticed that students, during their interviews, were very satisfied with their studies, the faculty, the services and care offered by the Department. They have also recognized the positive value of team work offered by the Department for several labs and projects.

Regarding the availability of learning resources and student support, the evaluation of the faculty and the Department follows the standard norm of most public universities. This means that there is only a small number of students who are interested in participating in the evaluation process.

The Undergraduate Programme covers a variety of courses relevant to Bioinformatics, Biology, Medical Engineering, Computer Science (Informatics). This gives to the students a variety of options to follow.

Panel Judgement

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

Panel Recommendations

- A more constructive collaboration is needed for integrating the Department with other units, like the Medical School, the local Hospitals and other biomedically oriented organizations. This will increase the students' hiring opportunities.
- A more structured process should be put in place for collaborations between the Department and the local, regional and national employers.
- A mechanism should be put in place in order to encourage students to progress in their courses by demanding the completion of a given percentage of ECTS (e.g. 75%) before the students can progress from the first two years to the third year and beyond.

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 Departmental website includes a wide range of relevant and useful publicly available information that includes: A concise general description of the Department; Information (including CVs) of all teaching, research and administrative staff; Detailed description of the undergraduate and postgraduate programmes (course outlines according to HAHE standards), including an up-to-date comprehensive study guide as well as information regarding the diploma thesis project and practical training internship; Regulation of conduct in laboratory courses; Regulation of exams; Description of Officially Instituted (Θεσμοθετημένα) Research laboratories and their activities; Information regarding alumni and career opportunities. Furthermore, the website provides links to the central UTH website with information regarding career opportunities (DASTA = Δομή Απασχόλησης και Σταδιοδρομίας), accessibility and disability services (PROSVASI), counseling and psychological support, health care, housing, awards and scholarships, etc.

There is a direct link of the Department website with student exchange programmes, such as Erasmus+ including rules and relevant advice. However, this suffers from the fact that a lot of information is kept locally in Volos (the UTH headquarters) but not in Lamia. The EEAP thinks that, in addition to academic staff, the CSBI Department should have a local Erasmus+ representative (a dedicated employee) to help students with mobility questions.

Although faculty members' CVs are available (with variable format and content) on the CSBI website, the presentation of key faculty quality indicators is not consistently informative. Also, not all faculty members have a Google Scholar profile. The EEAP urges faculty to develop one as it is free and it is constantly updated automatically.

Notable publicly available (on the website) features of the CSBI programme are its award-winning IEEE Student Chapter and its LinkedIn Alumni Group which contribute to the professionalisation of the students. Overall, the information publicly provided is comprehensive and covers most topics in a satisfactory manner.

The CSBI Department has in place a mechanism (mainly assured by one faculty member) connecting the Department with the local community and social partners. The EEAP believes this is an excellent idea that should become more permanent with a task force rather than a single person.

A point to consider however is that most of the above information is available in Greek whereas the information in English is far more restricted and in summary form. In several cases, links leading to the main UTH website provide information in Greek but not in English. An effort must be made for all centrally available services on the main UTH website to become available also in English. The Quality Assurance Policy of the UTH site, for instance, is not available in English (link not active). Furthermore, except for the above-mentioned LinkedIn Alumni Group, there is no presence in social media (such as Twitter, Facebook, Instagram etc.) commonly employed by international university departments in order to promote activities, provide up-to-date information etc. The website should also become more modern with enhanced / more attractive features. This could be taken up by the existing committee on Internet Promotion (Epitropi Diadyktiakis Provolis).

Additional public information exists regarding scientific conferences, publications, workshops, innovation festivals and other ad hoc and upcoming events and activities.

Panel Judgement

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

Panel Recommendations

- The Department should provide all available information in English for the international audience, and particularly for people interested in joining the Department through exchange programmes such as Erasmus+. Moreover, this will help in the efforts of the Department to become more open to the world and attract visiting professors and researchers.
- The Department is also encouraged to establish its presence in popular social media, in line with current worldwide trends. This will provide a universal forum to advertise available curricula, provide news and updates in regard with Departmental activities etc.
- Enhanced features in a more attractive website.
- More uniform website design in the context of the University.

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 UG Study Programme compliance is assured by its annual internal assessment which is set out on the basis of a clear flowsheet of actions including input to OMEA from faculty members and students with the possibility of corrective feedback. Components of this monitoring and assessment include the evaluation of teaching staff by students, the evaluation of courses and workshops by students and the evaluation of the educational material by the teaching staff. The collection and management of information is systematic and adheres to the methodology and content proposed by HAHE with reliance upon the MODIP Information System (central data collection and handling). The process of internal assessment involves 9 distinct steps that are clearly set out in the document 'DESCRIPTION AND ANALYSIS OF OMEA PROCEDURES'.

Some of the inputs for the revision of the UG Study Programme include the continuous monitoring of graduates, the enrichment of teaching with global trends in digital learning and new research advances, and the Department's contacts with the realities of the labor market. The Department is to be praised for its active pursuit of continuous improvement in its programmes as shown by examples (avoidance of extensive course overlaps, interactive learning, auxiliary supportive teaching in response to course evaluations, educational visits) and is encouraged to use KPIs more extensively and cross-check their achievement with the faculty members.

The EEAP believes that appropriate actions are being taken to identify and address issues with the changing societal needs, which, in turn can further improve the CSBI programme. The serious engagement of the Department with a wide range of student-oriented and socioeconomically-targeted activities (e.g., IEEE Student Branch with distinctions in competitions like "Mind the

Gap" 2017 for development of a Home System for Helping People with Dementia; "IEEE EPICS" 2017 for development of open code software in health applications, etc.) is highly noteworthy.

In accordance with the good family climate prevailing among students and their teachers, the EEAP supports the role of academic advisor for students since their first semester and wishes to encourage the strengthening of this informal advising service to further improve student success (e.g., less student drop-out, higher diploma average grade, smooth insertion into labor market or postgraduate studies, etc.).

The effectiveness of the procedures for evaluating student performance needs to be more regularly discussed. The EEAP suggests the setup of mechanisms that identify individual student interests, such as, for example, for students that are research oriented and wish to pursue a career in academia vs. for students that wish to pursue employment in hospitals or industry.

Panel Judgement

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

Panel Recommendations

- The English webpage of the Department and all its links with central information (UTH) as well as relevant external sites must be expanded, improved and made functional. These measures will help the dissemination of high-quality information through the participation of students and faculty in exchange and research programmes and in fostering conditions for innovation, extroversion, interconnection with society, the labor market and the economy, helping to reverse the brain drain and support the country's growth prospects.
- The identification of key performance indicators and their attainment in the internal accreditation report ('B1 PROTASI AKADIMAIKIS PISTOPOIISIS') should become more explicit, aligning the KPIs with the objectives of the proposal for accreditation. Also, several values of the HAHE indicators should be cross-checked by the faculty members to ensure their roles and achievements are properly registered.
- A more accurate assessment should be made to align student expectations, needs, and satisfaction with the programme. As was presented to the EEAP, MODIP may need to be more involved in ensuring the effectiveness of the monitoring programme implemented by OMEA.
- A closer interaction (e.g., in the form of a workshop) between HAHE and the Department (with support from OMEA and MODIP) will ensure that central decisions around the accreditation process are fully understood by the entire Department. The relationship between the current accreditation process (πιστοποίηση) and the old evaluation process (αξιολόγηση) does not appear to be fully appreciated.

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 Department had an external evaluation audit from 30/10/2011 to 4/11/2011 by a panel of four expert evaluators drawn from the Registry constituted by the then HQAA in accordance with Law 3374/2005. Two members of that panel are also members of the current EEAP. From the time of that audit to today, the Department has transformed and evolved to a new structure, a new operating framework and significantly increased capacity of operations. Key to this evolution was the incorporation of the Department to UTH.

It is notable that the Department took into consideration the recommendations of the initial EEAP and has established or implemented action to improve. As such:

- The operating environment has changed as a result of being part of a very large University.
- A more orderly student progression through the UG curriculum is evident, however the recommendation for prerequisites has not been implemented.

- The mobility of students via the Erasmus+ and other programmes has increased (but it can be further improved) .
  - A postgraduate programme has been established.
  - Collaborative learning is further developed, often with the aid of audio-visual teaching methods (which was necessitated in the period preceding the current audit due to the COVID-19 pandemic).
  - The number of Faculty members has increased.
  - The funding for research has increased mainly from participation to a number of National Research Programmes. However, the Department should focus more in

cultivating and fostering collaborations with a greater number of local, national and international parties, supporting its multidisciplinary nature.

- Some funding from alternative sources has been attracted via increased visibility of Biomedical Technology.

Due to various constraints in the operating framework of Greek Universities, two of the recommendations were beyond the control of the Department and as such have not been implemented, namely:

- The extension of the current curriculum to a longer period (5 years degree).
- The minimisation of certain bureaucratic procedures especially in purchasing and hiring.

On 16/4/2019 the Department had its first internal audit of the Quality System in accordance to the relevant procedure of its Quality Manual, mainly reflected in the Proposal for Accreditation submitted to HAHE. The audit resulted in 2 recommendations:

- Improvement of the procedure for the revision and approval of the Curriculum. The latest and current version of the Quality Manual includes now a fit for purpose procedure.
- Insufficient records of the analysis of the students' questionnaires for the ongoing evaluation of the teaching output. Although there is some evidence of this analysis, the EEAP believes this can be further improved.

This is the first time the Department performs an external audit of its Quality System.

The EEAP believes that substantial progress has been made since the last external audit and all recommendations have been taken into consideration and most of them implemented with success.

Panel Judgement

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

Panel Recommendations

None

PART C: CONCLUSIONS

I. Features of Good Practice

This is a young and dynamic Department, fostering a very close working environment between the Faculty and students. The Department has evolved, grown and improved at a fast pace in the last few years. The Faculty, although it operates within the well-documented Greek University confines, has managed to have a substantial research output with above average publication indices. Notably, the Department has attracted a number of highly research active faculty members contributing significantly to the international visibility of the Department. The teaching quality and commitment of the Faculty is reflected in very positive student evaluations.

- When it comes to the Quality Management System, the Department ought to be congratulated for putting together in a very short period of time a quality framework which is fit for purpose and it is actively used for the improvement of the Department.
- The Department has managed to implement the curriculum successfully irrespective of the serious governmental budget cuts, limited number of faculty members and administrative personnel, limited space and infrastructure resources, versus an increased number of students.
- With regards to teaching, learning and assessment, we note that the Department has established a strong curriculum with pillars in mathematics, computer science and biomedicine, and it overcomes successfully many of the hurdles in maintaining such a multidisciplinary programme. Good practice is illustrated through student surveys being carried out for each course in a regular, detailed and transparent manner.
- For student admission, progression and certification, the EEAP stresses good practice in full compliance with European standards (ECTS), student mobility programs through Erasmus+, as well as internship opportunities.
- The general close-knit atmosphere of collaboration in the Department is also noted. The Department students and faculty members are highly motivated and dedicated to continuous excellence.
- Research culture is encouraged by the academic staff members with notable success in students achieving excellent employment in academic and industrial Research and Development.
- Practical training works well and should be expanded.
- Dedicated and conscientious teaching staff working under sub-optimal conditions is offering high quality academic services in both research and teaching.
- The UG Study Programme and the research activities of the Department are up to date and reflect the current state of the art in the disciplines related to CS and BI.
- The degree awarded is unique in Greece and strongly appropriate for the labour market.
- There is the possibility of Certification of CSBI graduates for teaching in secondary education.

II. Areas of Weakness

- One of the major strengths but also a key weakness of the Department is the applied multi-disciplinary nature of it, combining different domains from a very early stage of the curriculum. Although this aspect creates many challenges, it is the Department's key differentiator. This key differentiator should be used to promote better the Department's unique positioning within the National and International Academic Communities. This Department's positioning statement (mission) should reflect on the desired output of the UG programme (e.g. what is the expected career progression of the students) and why it is different from other similar Departments.
- It is notable that work on this positioning has been started by the execution of a SWOT analysis. However, we believe this should be followed by a top down approach where a strategic vision for the Department for the next 5-10 years is articulated, which will define the growth trajectory of the Department in the years to come.
- As part of the Department's positioning, we believe it is necessary for it to engage more with external bodies in a more structured way (external bodies such as Academia, Medical practices, relevant industry, patient groups and local authorities) building an ever-growing network of external collaborations, not only for research and attracting funds, but also for commercial collaborations and social sustainability. Moreover, input from those external bodies should be the basis for revisions of the curriculum.
- It is noted that some of the weaknesses of the Department are due to constraints imposed by the operational environment of Greek universities (lack of funding, bureaucratic procedures, etc.), and those weaknesses cannot be rectified at the Department level.
- In student assessment, formal procedures for (i) the evaluation of exam results in each module and across modules in each cohort, and (ii) dealing with mitigating circumstances and student appeals are needed.
- In terms of student progression, there is a significant number of students that do not graduate in good time. Also, a declining GPA is noted in recent years.
- The growth of the Department of CSBI has rendered its current premises largely inadequate and this is exacerbated by the fact that its facilities are scattered in two different premises in the city of Lamia. The lack of public transportation between Building A and Building B as well as other points of interest (e.g. the Hospital for practical internships and other specific biomedical-oriented educational activities) is a major unresolved issue which directly affects the continuous quality improvement of the CSBI programme.
- There is lack of access to athletic and sports activities, which could be solved with the help of the local authorities and athletic clubs. In addition, child care provision in proximity to the campus seems to be lacking.
- During the last several years of the economic and social crisis in Greece, most highly trained laboratory staff (ETEP) were promoted to special purpose teaching staff (EDIP). This created a significant reduction in the IT staff assuring technical help-guidance, maintenance, etc., thus increasing their workload and lowering their availability to support efficiently the rest of the Department's personnel.
- The number of courses is still high, the course prerequisite concept is non-existent, the number of students enrolled exceeding v+2 years remains high.
- Moreover, there is a need to better monitor students in the course of their studies in an effort to provide more feedback to faculty members.

- Sub-optimal number of faculty members, linked with a significantly high student – staff ratio.
- Insufficient collaboration with the Medical School, hospitals and industry.
- Inadequate research administrative support for the running of research projects and still excessive bureaucracy associated with research activities.
- Low student participation in the evaluation process
- Low Erasmus+ participation
- Unevenness of faculty accomplishments especially in terms of research output.
- Insufficient EU and other international competitive funding.
- Insufficient dissemination of information regarding the Department's accomplishments, especially in the English language webpages.

III. Recommendations for Follow-up Actions

Below we provide five recommendations for the Department, establishing the main directions where the EEAP believes there may be opportunities for improvement. Should the Department decide to adopt any of them, this should be reflected in a revision of the Quality System currently in place (for instance new or revised KPIs, procedures, committees, etc.)

1. Visibility and outreach:

The EEAP believes that the Department should substantially increase its outwards-reaching profile by instituting and implementing a number of strategic actions linked to the quality framework. A number of individual recommendations are offered under each Principle above, where visibility to external entities and stakeholders from the National and International Community could be increased and possibly attract additional resources from external donors. Networks to external stakeholders such as Academia, Industry, Healthcare Facilities, Community groups etc. should be fostered as one of the priorities, involving students wherever possible (for example in collaborative research projects, industry placements, etc.).

2. Teaching and Learning:

The EEAP believes that the Curriculum could be further improved to be able to meet the requirements of emerging advances in Computer Science and Biomedical Informatics. Topics such as the need for prerequisites, better student/lecturer ratios, need for modernisation of topics, reduction of the number of courses offered, reduction of the number of stagnant (> n+2) students, exam process scrutiny and procedures for appeals and mitigating circumstances are proposed and analysed in corresponding Principles above.

3. Facilities and Infrastructure

The EEAP believes that the available infrastructure and facilities do not cover the needs of the Department. As such the Department should consider actions to improve the facilities offered to the Faculty and students. We appreciate that central budget constraints create major obstacles to following this recommendation, however a more strategic approach to attract the necessary funds from the Ministry or other sources should be explored.

4. Recognition of Excellence and Rewards

The EEAP believes that the Department should establish a culture and policy of recognition and rewards for student and Faculty excellence. This should be instituted and followed by the Quality Policy as it is strongly linked to continuing improvements. A number of individual recommendations are offered in the corresponding Principles above.

5. Human Resources:

The EEAP believes that the Department should increase the number of Faculty members and administrative support staff. Resource challenges explained in the corresponding Principles affect negatively the quality of operations. Sometimes, it is beyond the ability of the Department to attract the funds to support this goal, as funds are allocated centrally.

IV. Summary & Overall Assessment

The Principles where full compliance has been achieved are: 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 members of the External Evaluation & Accreditation Panel

Name and Surname **Signature**

1. **Prof. Emeritus Spyridon Agathos** (Chair), Université Catholique de Louvain, Louvain-la-Neuve, Belgium

2. **Prof. Nikolaos Bourbakis,** Wright State University, Dayton, OH, USA

3. **Dr. Haralambos Hatzakis,** Biotronics3D Ltd, London, UK

4. **Prof. Constantinos Pattichis,** University of Cyprus, Nicosia, Cyprus

5. **Dr. Sophia Tsoka,** Reader, King's College London, London, UK