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ΤΗΣ ΠΟΙΟΤΗΤΑΣ ΣΤΗΝ ΑΝΩΤΑΤΗ ΕΚΠΑΙΔΕΥΣΗ

HELLENIC REPUBLIC
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HELLENIC QUALITY ASSURANCE
AND ACCREDITATION AGENCY

EXTERNAL EVALUATION REPORT

NATIONAL TECHNICAL UNIVERSITY OF ATHENS

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Ευρωπαϊκή Ένωση
Ευρωπαϊκό Κοινωνικό Ταμείο

Επιχειρησιακό Πρόγραμμα
Ανάπτυξη Ανθρώπινου Δυναμικού,
Εκπαίδευση και Διά Βίου Μάθηση

Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης



ανάπτυξη - εργασία - αλληλεγγύη



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1. EXTERNAL EVALUATION COMMITTEE

The Committee responsible for the External Evaluation of the University/Technological Education Institution named **National Technical University of Athens** (NTUA), comprised the following five (5) expert evaluators drawn from the Registry kept by the HQA in accordance with the Law 3374/2005 and the Law 4009/2011:

- 1. Prof. Georgios B. GIANNAKIS** (Chairman)
University of Minnesota, USA

- 2. Prof. Anthimos GEORGIADIS**
Leuphana Universität Lüneburg, Germany

- 3. Prof. Thomas PANAGOPOULOS**
University of Algarve, Portugal

- 4. Prof. Sotirios SKEVOULIS**
Pace University, USA

- 5. Prof. John L. VOLAKIS**
The Ohio State University, Columbus, Ohio, USA

N.B. The length of text in each box is free. Questions included in each box are not exclusive nor should they always be answered separately; the Committee's reply to those questions is meant to provide a general outline of issues that need to be addressed.

2. INTRODUCTION

2.1 The External Evaluation Procedure

- Dates and brief account of the site visit
- Whom did the Committee meet?
- List of Reports, documents, other data examined by the EEC
- Groups of teaching and administrative staff and students interviewed
- Facilities visited by the EEC

The External Evaluation Committee (EEC) for NTUA arrived in Athens on May 22, 2016. Its first private meeting took place in the morning of the following day. In the morning of May 23, the EEC was briefed by the representative of ADIP regarding the evaluation process. Following this briefing, the EEC met with the NTUA Rector Prof. I. Golias, Deputy Rector for Academic Affairs and Administration, Prof. D. Papantonis, and Deputy Rector for Financial Planning and Development, Prof. I. Paspaliaris. In the afternoon of May 23, the EEC met with the Quality Assurance Unit of NTUA, abbreviated as MODIP, before meeting the President and members of NTUA's Council. On May 24, the EEC split into two groups. Group A (Profs. Panagopoulos and Georgiadis) visited the School of Civil Engineering, while Group B (Profs. Giannakis, Skevoulis, and Volakis) visited the School of Chemical Engineering. Both groups met with the respective Deans, representatives of the Internal Evaluation Groups (IEGs/OMEA), selected groups of undergraduate and graduate students, and selected groups of faculty members as well as members of the technical laboratory staff, from these two Schools. Group A had a brief tour of the campus which included a visit to the Computer Center, while Group B toured the library, sport facilities, and drove outside two of the student dormitories. By the end of May 24, the EEC met with the NTUA alumni and external stakeholders.

The EEC read the Internal Self Evaluation Report, along with individual reports from a subset of Schools. At the request of the EEC, the committee had a meeting with eight (out of nine) Deans, on Wednesday, May 25, 2016, to form a more comprehensive view of all NTUA Schools. Unfortunately, the schedule did not include visits to sites of all Schools, and meetings with faculty, staff, and students from 7 (out of 9) Schools. This was due to misunderstandings between ADIP and NTUA. NTUA happily scheduled a meeting with most Deans who provided oral presentations to the EEC describing the School activities and responses to their earlier external evaluations. Finally, the EEC presented its oral report to the Rector of NTUA and the Deputy Rectors on the afternoon of May 26, 2016.

Please decide in respect to the specific evaluation area (&2.1):

	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

The external evaluation procedure was adequate, and provided the EEC with at least the minimal information necessary to carry out the evaluation. Given that templates of reports from evaluations of other institutions were available, one would expect the NTUA leadership to have a presentation streamlined to address the issues the EEC was asked to report on, and also lay out the vision and strategy of the Institution in print. Except for the Internal Report that was available in advance, additional material was provided during the evaluation week itself, a considerable part of which the EEC had minimal or no time to review. It would have been also desirable to visit all Schools, and have more interactions with individual faculty, staff, and students.

2.2 The Self-Evaluation Procedure

Please comment on:

- Appropriateness of sources and documentation used
- Quality and completeness of evidence provided and reviewed
- The extent to which the objectives of the internal evaluation procedure have been met by the Institution
- Description and Analysis of the Self-Evaluation Procedure in the Institution
- Analysis of the positive elements and difficulties which arose during the self-evaluation procedure
- Whether the self-evaluation procedure was comprehensive and interactive

The EEC found NTUA's self-evaluation procedure comprehensive. The process worked as follows: each School elected its internal evaluation group (IEG/OMEA) responsible for the collection and compilation of data and reports at the School level; reports generated at this level were then funnelled to the quality assurance unit (QAU/MODIP); MODIP interacted with the IEGs/OMEAs in a cooperative and consultative manner in compiling the internal self-evaluation report. The procedure included bottom-up and top-down iterations, which resulted in an overall effective outcome. The EEC recognized that all levels involved in the procedure did so consistently. All together, they appear committed to a constructive process that will hopefully improve NTUA's quality altogether.

The generated document of 382 pages appeared detailed, descriptive, and comprehensive. However, given its volume and the fact that the time provided was rather short (about a week before the external evaluation), not every EEC member has read the report in its entirety. A few gaps in quantitative assessments (e.g., compliance with ECTS units) were identified, but did not prevent the EEC from forming a qualitative view of NTUA status. The overall evidence provided was consistent with the information contained in the evaluation documents.

The EEC found the procedure comprehensive and interactive; however, EEC recommends representative members of the administrative staff, as well as student representatives to be included in every level of the internal evaluation procedures.

Please decide in respect to the specific evaluation area (&2.2):

	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

NTUA put considerable effort to produce a comprehensive internal evaluation report that EEC deemed commendable. However, the procedure could benefit from concrete input from the administrative staff and students, and the reported entries could benefit from clarity and better streamlined content and timelines at places (e.g., adherence with ECTS constraints across Schools).

3. PROFILE OF THE INSTITUTION UNDER EVALUATION

3.1 Institutional Governance, Leadership & Strategy

Please comment on:

3.1.1 Vision, mission and goals of the Institution

- What are the Institution's mission and goals?
- Priorities set by goals
- How are the goals achieved?
- Procedures established by the Institution to monitor the achievement of goals
- What is your assessment of the Institution's ability to improve?

The vision, mission, and goals of NTUA are outlined on pp. 29-33 of the internal evaluation report, dated July 2015. Additional memos were given to the EEC during the visit, including one authored by NTUA's Administrative Council, led by Prof. Triantafyllou. Among the goals are:

G1) Improved services through modern electronic communication and processes. Among the noted goals in a supplement given to the EEC is modernization of processes, and introduction of a uniform electronic approval and communication process (e-business/e-approval/e-certification).

G2) Sustained top-quality education at the undergraduate and graduate levels with enhanced international presence and recognition, as well as accreditation and alignment of program of studies with European and international standards. Related efforts include recruiting of foreign students and improved student services.

G3) Growth of the research program through: a) strengthening of basic and applied efforts in contemporary areas; b) modernization of the organizational support components; c) improvement of the research infrastructure; and d) enhancement of the research funding and impact.

G4) Refined financial strategies, entailing: a) cost reductions, and b) leveraging NTUA's real estate to better serve the needs of the institution.

G5) Building infrastructure, development, and modernization.

G6) Enhanced public relations and awareness of NTUA's impact to the community.

Undoubtedly, the top NTUA students and the top NTUA faculty likewise, are the "cream of the crop" in Greece. Up to a certain extent justifiably, NTUA has thus (over)emphasized the need to maintain this "brand name," perhaps to a level undermining what it takes to do so in today's competitive international arena.

Nearly all deans recognized the need for reduced course loads. Also, interviewed students and alumni noted the need to improve relations with the Industry for professional development and employment opportunities. However, there does not appear to be a timetable or a specific list of priorities and strategies to accomplish the proposed improvements. Developing such tables based on tangible criteria will be instrumental for achieving the noted goals, which are reasonable. Implementation of these goals will further require incentives to engage faculty, clear 'job descriptions' for staff, and monitoring as well as feedback among involved parties. In addition, merit-based rewards, avoidance of in-breeding and meritocracy in hiring the 'best' faculty and staff in areas of growth will all play a pivotal role to ensure NTUA's reputation in decades to come. Furthermore, partisan approaches to leadership, governance, and growth of NTUA, along with the an inflexible regulatory framework, the State's intervention in the number of students entering, and the Nation's stringent finances, are all stumbling blocks to account for when setting up the goals and pertinent action plans. Although the goals were articulated and comparable to those at top Universities, there is no evidence that a) how and whether NTUA leadership can pursuit these goals; b) whether the State and Faculty processes will allow for their implementation; and c) what incentives can be established for their timely implementation. For example, although there are goals to create biomedical and microfabrication research programs/institutes, there is no mention of a practical process to pursue these initiatives or to provide financial incentives to pursuit research areas beyond those pursued by the faculty based on past training and personal interests.

Nevertheless, the EEC was positively impressed with individual faculty and a few committed deans (e.g., those of Chemical and Naval Engineering), who manage to operate at high-quality levels under difficult financial circumstances.

<i>Please decide in respect to the specific evaluation area (&3.1.1):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

NTUA's mission statement and goals are rather broad, and could benefit from a pertinent time table, possibly including priorities. A streamlined set of goals will provide confidence and establish the needed procedures for implementing the broader set of goals.

3.1.2 Organizational Development Strategy

- Effectiveness of administrative officials
- Existence of effective operation regulations
- Specific goals and timetables
- Measures taken to reach goals

The administrative staff team provided EEC with the general chart that was last updated in 2014. It appears that on average the administrative support provided is sufficient. Its effectiveness could be improved in certain tasks, including the modernization of electronic 'form and approval' system.

Operation regulations are disjoint from NTUA regulations, since administrative staff are hired through bureaucratic processes (allegedly without meritocracy constraints) and being public employees, they report to the State.

Goals, timetables, and measures taken to improve operation of the organization were not clearly articulated to the EEC. Areas of improvement include a fully electronic processing system for student transcripts, travel, employee, financial and grant requests, among others. NTUA officials noted that an electronic management and approval/request system is part of their short-term plans. As explained by the rector, current State conditions challenge the provision of a timetable.

<i>Please decide in respect to the specific evaluation area (&3.1.2):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

The administrative chart presented to the EEC was descriptive. However, specific 'job description,' and the reasoning behind allocation of tasks across services was rather unclear. The newly elected leaders stated a number of strategies for improving administrative services.

3.1.3 Academic Development Strategy

- Response of the Institution to Faculties and Departments
- Goals and timetables
- Measures taken to reach goals

NTUA enjoys unquestionably high reputation for its top faculty and students entering among technical academic programs in Greece, and for its graduates excelling worldwide. Its academic program is organized in 9 Schools, each comprising what is typically referred to as a single Department. Each School offers undergraduate degrees, at least one M.Sc., and one Ph.D. degrees. Cross-departmental M.Sc. programs are also available.

The Institution responds to Faculties of individual Schools through standard interactions of the Rector and Deputy Rectors with the Deans. Individual schools review and update their programs of study that are supported through funds allocated by the Institution according to an agreed formula.

NTUA goals and timetables to implement the academic development strategy were outlined, but at a level of specificity that was deemed only partially clear to the EEC. Challenges with the current processes for approval by the Institution and the Faculty Senate, as well as measures taken to reach these goals were also unclear.

Goals and strategies recommended by the EEC for academic development should include:

AD1) Ways to limit the influx of students, revamp the program of studies to include prerequisites, avoid overlapping classes (within and across Schools), minimize number of courses and stagnant students, and shorten examination periods along with the average graduation times across the Institution.

AD2) Mimic most Greek universities in exposing (in the Study Guides across NTUA schools) the mapping of NTUA courses to ECTS units, and increase graduate instruction in English.

AD3) Academic mentorship of students and faculty throughout their tenure at NTUA.

AD4) OMEAs per School and MODIP centrally should enhance their interaction to facilitate along with Deans and (Deputy) Rectors the strategies, priorities, action plans, and timetables for implementing AD1-AD3.

<i>Please decide in respect to the specific evaluation area (&3.1.3):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

NTUA has provided EEC with a set of goals and plans including updates in developing their academic strategy. However, measurable outcomes, challenges, and a rough timetable would be useful in the proposed strategy.

3.1.4 Research Strategy

- Key points in research strategy
- Research strategy objectives and timetables for achieving them
- Laboratory research support network
- Research excellence network
- Existence of research assistance mechanisms (for preparing proposals, capitalising on patents and innovations, finding partners for research programmes, etc.)

The leadership is aware of how contemporary areas of research, external funds, new institutes, and revenue generation income from tuition and real estate properties can aid realizing the plans to maintain NTUA's excellence in research, enhance the opportunities for faculty and graduate students, and improve its rankings. NTUA's stated plans to this end include:

- R1) strengthening and promotion of basic and applied research, including pursuit of cutting-edge research directions that will also generate needed resources;
- R2) modernization of organizational support components, including the research infrastructure;
- R3) support of the teaching faculty in developing research interests, including start-up packages, web links, as well as notification of changes in State laws and institutional updates;
- R4) development of processes to increase research impact, including the development of seminars, workshops, international collaborations, and links with agencies that fund game-changing research.
- R5) the council's recommendation for institutes in: a) Communication and Computing Systems, b) Nanotechnology and Materials, c) Life Sciences and Biotechnology, d) Environment and Energy.

Goals R1-R5 are well thought out, and will be nicely complemented with the planned start-up activities in the technology park at Lavrio. However, timetables were not specific, which is in part understandable given the government cuts in State funding, and further motivates exploring alternative sources of revenue.

Plans for research laboratory support were argued to be in place, but were not clear to the EEC. Likewise, research infrastructure improvements may be well planned, but were not articulated thoroughly.

A percentage of faculty members indeed pursue top-notch research, but NTUA-wide research efforts could benefit from strategies facilitating cross-disciplinary, multi-school, multi-university, and Industry-University national and international collaborations. Research excellence could be promoted further through creative means of increasing the average number of Ph.D.s per faculty member, and also reward faculty with high number of citations, awards, and h-index.

Mechanisms to assist researchers is reasonable, and the resulting overhead (from ELKE and ICCS) were noted and highlighted.

<i>Please decide in respect to the specific evaluation area (&3.1.4):</i>	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

NTUA leadership put forth several noteworthy research initiatives. Their timely implementation will have major impact on the institution's research excellence, and will further propel its international reputation. Improving faculty collaboration and international pursuits will also add to NTUA's value through contemporary areas of research, and measures to increase the number of quality PhDs, and citation metrics per faculty. Aligning research goals across Schools and effective integration of research with teaching objectives, are certainly worth strategizing further.

3.1.5 Financial Strategy

- General financial strategy and management of national and international funds
- Regular budget management strategy
- Public investment management strategy

- Organisation and strategy of the Special Account for Research Funds (SARF)
- Organisation and strategy of the University Property Development and Management Company
- Existence of a Quality System for Financial Management (e.g. ISO), computerisation management and Budget monitoring (Regular Budget, Public Investments Programme, SARF Budget, etc.)

Being a public institution, NTUA is mainly financed by the State and its asset management follows the country's rules and regulations. Similar to all Greek universities, NTUA has suffered dramatic cuts in its operating budget that now corresponds to 80% of that received in 2010. Additional funds from TSMEDED (the Engineer's Social Insurance) has also been reduced. There is a deficit of 2430337.15 € into the financial balance in 2014. The institution cannot cover its running costs, including payments of the electricity bills during 2016. At the same time, the number of students has increased significantly in recent years, leading to a dangerous underfunding and overall operation of the institution.

Through a variety of measures and approaches, NTUA has managed to offer all study programs and services basically as before, without major sacrifices in quality and performance. The most effective approach was through increased funding from a number of research projects that resulted in increased overhead that was used to cover operational costs.

The institution implements the financial management procedures foreseen by the government, and its quality assurance system. The electronic implementation of its management and budget monitoring represents a strategic aspect of NTUA. However, there are a number of specific constraints that impede the institution's ability to have additional income, including:

C1) Given the legislation- and state-imposed constraints, leveraging of real estate donations could be more creative in revenue generation relative to e.g., having them abandoned;

C2) Financial, budgetary and legal system that limits NTUA's ability to increase income from non-public sources and manage its resources effectively;

C3) Pending establishment of new R&D institutes, which could increase income from grants.

NTUA offers all its M.Sc. courses without fees. Similar to other Greek Universities, even minimal tuition fees could generated much needed revenue these days. Aggressive leveraging of R&D results and IP through patents, licenses, as well as spin off companies could be a further possibility for non-government funds. The EEC strongly recommends consideration of these opportunities.

<i>Please decide in respect to the specific evaluation area (&3.1.5):</i>	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

The excellent performance in earning R&D grants and the associated overhead (through ELKE and ICCS) compensates for the deep State cuts. There are ample opportunities for revenue from non-public sources, which could markedly improve NTUA's financial wellness.

3.1.6 Building and Grounds Infrastructure Strategy

- Strategy key points
- Objectives and timetables
- Measures taken to reach goals

- Deviations from model 1 campus/HEI

Except for that of Architecture, all other NTUA Schools are located on a large-size campus in the suburb of Zografou, Athens. Two additional NTUA establishments have their home in Metsovo and Lavrio, but these do not directly influence its academic and research activities. The Zografou campus occupies an area of 900 0000 square meters, while the buildings housing the School of Architecture are on Patision Street in the center of Athens. The administrative services, teaching rooms, laboratories, library, IT services, student residences, canteen, and sports facilities are in the Zografou campus, that is nicely landscaped and accessed through three entrances.

Running and maintenance costs are high and represent a serious challenge to the leadership. The EEC was informed that even the electricity costs cannot be afforded. The water supply system presents another challenge because the self-supplied water has low quality, which causes major safety concerns for the laboratories.

Apart from high maintenance costs, there are security issues for the main campus and the buildings in the center of Athens. The leadership acknowledged that those much needed improvements are high in their wish list, along with the cafeteria and dormitory buildings. The plans include:

P1) Construction of a building with appropriated teaching halls;

P2) Building for additional student residences; and,

P3) Building for an additional sport facility.

There are also plans for improving campus traffic, taking measures for environmental-friendly infrastructure, as well as better accommodating persons with disabilities.

<i>Please decide in respect to the specific evaluation area (&3.1.6):</i>	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

Space and infrastructure fulfils most of NTUA's needs. However, maintenance, restoration, improvement, and campus upgrades are needed in the classrooms, landscaping, and toward an environmentally- and handicapped-friendly campus. EEC strongly supports the strategic goals of NTUA leadership to this end.

3.1.7 Environmental Strategy

- Recycling strategy and measures taken to reach goals
- Hazardous waste management and measures taken to reach goals
- Urban waste management and measures taken to reach goals
- Green energy strategy and measures taken to reach goals

At present, recycling of paper, glass, plastic and urban waste, is the responsibility of the Zografou municipality. Further, waste treatment, including batteries and toxic material, are collected in dedicated containers on a volunteer basis within the institution. In their internal evaluation, the institution mentioned that there is no concern about hazardous waste in the existing laboratories; personnel is dedicated to care for plants and the irrigation system; and photovoltaics and smart lighting are currently deployed in a few buildings.

However, the EEC encourages the institution to define its own environmental strategy in accordance to ongoing and future developments in this very challenging area. A dedicated green energy strategy

and corresponding measures to also account for sustainability, were not explicitly provided. Notwithstanding, environmental issues should also concern individual Schools.

Please decide in respect to the specific evaluation area (&3.1.7):

	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

Recycling and high risk waste management is considered at places. Nonetheless, a well-articulated and thoroughly planned green energy strategy, along with a detailed account of planned environmental strategies and standardization, are highly recommended.

3.1.8 Social Strategy

- Exploitation and dissemination of the Institution’s Research Activities for the benefit of society and economy
- Promotion of interaction between the Institution and the Labour Market
- Sustained relationships with key local and regional bodies
- Contribution to the cultural development of society, the city and the region
- Reciprocal and long-lasting relationship with the alumni community

NTUA organises and supports a large number of cultural and sports events, thus also contributing to the community at the regional, national, and international levels. Schools and laboratories take initiatives to support cultural heritage, e.g. the holy birthplace restoration in Israel, or, helping in natural disasters, e.g. by rebuilding villages after the forest fire in west Peloponnese.

Being a cradle of highly skilled students, researchers and teachers, NTUA represents a pole of national and international successfully acting absolvents. It aims to strengthen the dissemination of the institution’s research activities to benefit the society, economy, and the labor force altogether.

NTUA offers a large number of student grants financed from various donations.

However, reciprocal and long-lasting relationships between its alumni, stakeholders and stakeholder’s organisations are not clearly mentioned. Also, promotion of the interactions between the institution and Industry could benefit from strategic development.

Please decide in respect to the specific evaluation area (&3.1.8):

	Tick
Worthy of merit	X
Positive evaluation	
Partially positive evaluation	
Negative evaluation	

Justify your rating:

NTUA’s contribution to the nation and the society is undoubtedly meritorious across the board: Research impact, outreach efforts, and education of engineers to serve the economy, and the labor force as a whole.

3.1.9 Internationalization Strategy

- Integration of the international dimension in the curricula
- Integration of the international dimension in research
- Integration of the intercultural dimension within the campus
- Participation in international HEI networks
- Collaboration with HEIs in other countries (with a specific collaboration agreement)
 - measures taken to reach goals

NTUA enjoys high reputation by the international research community, and actively participates in related research projects. Many international symposia are organized by and held at NTUA campuses. A number of memoranda of collaboration and ERASMUS contracts have also been established between NTUA and Universities in Europe and worldwide. However, alignment of NTUA curricula with international standards is a long overdue desideratum.

<i>Please decide in respect to the specific evaluation area (&3.1.9):</i>	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

NTUA is well integrated with the international research community, participating in various European R&D projects, and developing a collaborative study program with a French University. Moreover, NTUA places high priority in enhancing intercultural activities and participation in international HEI networks. However, the international dimension could be developed further.

3.1.10 Student Welfare Strategy

- Student hostel operation and development strategy
- Student refectory development strategy
- Scholarships and prizes strategy
- Sports facilities operation and development strategy
- Cultural activities strategy
- Strategy for people with special needs

NTUA charges no tuition fees in its M.Sc. courses. The institution offers many scholarships, fellowships, and prizes for outstanding performance of its students. It operates two dormitories, one of appropriated living quality, and an older one of considerably lower quality which is about to undergo major restoration. NTUA also plans to revamp the rectories on campus. Several sport facilities are in use and additional one are on the drawing board. A campus ambulance is also available.

NTUA organizes many cultural events and hosts performances from outside. It also places high priority in supporting cultural and scientific activities at the regional, national and international levels. However, the strategy and implementation efforts to accommodate people with special needs must be improved. The campus is at present not fully friendly for people with special needs.

Please decide in respect to the specific evaluation area (&3.1.10):

	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

NTUA has in place a commendable plan for the maintenance and rebuilt of dormitories, for student awards, and also for the operation of sports and cultural facilities. However, the strategy for people with special needs, the environment and sustainability, could benefit from improvement.

3.2 Strategy for Study Programmes

3.2.1 Programmes of Undergraduate Studies (first cycle)

Please comment on:

- the main strengths and weaknesses of the Programmes
- the basic obligations of students, e.g. attendance of lectures, course requirements, etc.
- the way the Central Administration of the Institution deals with any remarks and recommendations that the external experts pointed out in the External Evaluation of Academic Units

Do you wish to make any comment on a point not included above?

Main strengths

- The undergraduate curriculum is nicely attuned around basic knowledge and engineering practice, while being reasonably well balanced between breadth and depth.
- Albeit non-uniform across schools, there have been serious efforts by individual schools (e.g., Chemical Engineering) to reduce the number of courses and load per year, and thus better streamline the undergraduate curriculum in accordance with prior per-school EEC recommendations.
- In the two schools that the EEC heard from students, but also from the alumni, there is for the most part a positive impression expressed about the program, and overall a high morale projected about its impact on the training received, as well as its relevance to the job market, and the society at large (NTUA scores the highest among all Greek technical universities on these fronts).
- Growing culture among students to contribute high percentages of evaluations to individual classes, and their overall willingness to offer valuable input to their education.

Main weaknesses

- Stringent finances of the government/country have led to inadequate support of teaching staff, at places without skilled administrative support, preventing creation of new and maintenance of existing laboratories, to the extent that it jeopardizes the upcoming accreditation process.
- Unclear reasoning behind maintaining a 5-year Diploma arguably close to an M.Sc. degree (as opposed to a 4-year B.Sc. plus an 1.5-year M.Sc.), which is not aligned with most international and particularly European competing programs in the global economy.
- Inadequate flexibility and update of the program (which is still loaded and minimally changed over the last 18 years) to match the rapidly changing technology and market landscape.

- (iv) Less effective with regards to student attendance, coordination or lack of pre-requisites influencing the load and timely graduation, and also with regards to hands-on experience desired by professional society stakeholders, and with the asymmetric mobility of international students coming to NTUA from abroad (probably due to lack of instruction in English).
- (v) Unreasonably long graduation times (depending on how one truncates data, averages exceed 6 or 7 years); huge number of undergraduate classes; excess of senior students not passing double-digit, basic, mandatory courses; and excessively long examination periods shaping NTUA to a “permanent examination center” status (once registered, a student can continue taking exams “basically forever,” regardless of performance).

- Basic obligations of students

- (i) NTUA students are encouraged to attend and obliged to pass successfully a set of mandatory and elective classes that vary across schools, but also a so-termed Diploma Thesis, and in certain schools complete also a period of practical training. Minimum time is 9 semesters for the classes and 1 semester for the Thesis and practical training. Unfortunately, maximum time is not bounded. The average time exceeds 6 or 7 years.

- Central Administration vis-à-vis External Evaluation of Academic Units

Per-school EECs offered valuable feedback to individual Academic Units (Schools) that the present NTUA-wide EEC deemed that have been considered and partially addressed (from 25% up to 75% e.g., by Chemical and Naval Engineering) in the most recent internal evaluation report of NTUA. Severely reduced government funding as well as the low morale of working professionals in Greece, has significantly hurt implementation of suggested changes.

The will expressed by the quality assurance unit (QAU/MODIP) is there, but central plan and NTUA-wide strategy toward implementing (at least those more realistic) recommendations are still at a working stage. Collective vision and strategy to address main challenges facing the Programs of Studies (especially those not related to State finances and government interventions) is not clear. In its infrequent meetings, the Faculty Senate has not so far instituted policies to deal with main weaknesses (iii)-(v).

Additional comments

Besides the well-established brand name of NTUA, the leadership should seriously and centrally consider a top-down approach to curtail the number of courses, lower the average graduation time, significantly reduce the examination periods, and overall adopt best practices followed by the curricula of successful institutions nationally, and peer institutions internationally. Creative approaches to improve instruction and especially prevent “suboptimum teaching” performance should be developed centrally and systematically.

The State cannot add to the number of incoming students beyond what is allowed by the funding levels and the infrastructure provided.

The overall positive atmosphere between students, faculty, and stakeholders should be maintained and strengthened by enhanced participation of students in quality assurance bodies, higher rates in attending classes and filling evaluation reports, increased hands-on experience in coursework, and improved synergy to seamlessly integrate teaching with research.

<i>Please decide in respect to the specific evaluation area (&3.2.1):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

A number of issues originate from the problematic intervention of the State (reduced funding, policy of stagnant students, and increased number of incoming students). However, in spite of the well-appreciated efforts of students and faculty to maintain the unquestionable brand name of NTUA, the

introversion of the leadership and low degree of agility to streamline the curriculum, lower the average graduate time, and markedly reduce the examination periods, are areas that could be improved considerably.

3.2.2 Programmes of Postgraduate Studies (second cycle)

Please comment on:

- the main strengths and weaknesses of the Programmes
- the basic obligations of students, e.g. attendance of lectures, course requirements, etc.
- the way the Central Administration of the Institution deals with any remarks and recommendations that the external experts pointed out in the External Evaluation of Academic Units

Do you wish to make any comment on a point not included above?

Main strengths

In addition to those mentioned for the undergraduate program, the M.Sc. curricula offered demonstrate high-quality, cross-disciplinary programs, spanning multiple schools, on contemporary fields, resonating well with national and international market needs. Feedback from students was certainly positive, especially with regards to faculty adopting an open-door policy.

Main weaknesses

Besides those mentioned for the undergraduate program, the selection of graduate students varies across schools; space in certain cases was deemed insufficient, and likewise funds to maintain lab operation, and sustain M.Sc. programs altogether (given the reduced State funding and the choice to operate tuition free). Lack of a Graduate School to streamline efforts toward revenue generation (e.g., from even minimal tuition fees), and overall coordinate these programs across schools and over time, is evident.

- the basic obligations of students, e.g. attendance of lectures, course requirements, etc.

As with the undergraduate program, successful completion of a set of courses and a Thesis (number and duration vary across schools) suffice for graduation. Although relatively high, attendance here too is unfortunately not mandatory in a number of MSc programs.

- the way NTUA's central administration deals with any remarks and recommendations that the external experts pointed out in the External Evaluation of Academic Units

Same as with the undergraduate program, except that the absence of a Graduate School renders global monitoring, and implementation of a common vision and strategy, even more challenging.

<i>Please decide in respect to the specific evaluation area (& 3.2.2):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

The higher score relative to the undergraduate program is attributed to the more reasonable course load, and average graduation times. NTUA's argument for no tuition fees is that their quality programs will attract top students, but even minimal tuition fees could generate the much needed revenue. Steps toward extroversion with increased instruction in English, and the creation of a Graduate School to institute standards in postgraduate education would be worth taking.

3.2.3 Programmes of Doctoral Studies (third cycle)

Please comment on:

- the main strengths and weaknesses of the Programmes
- the basic obligations of students, e.g. attendance of lectures, course requirements, etc.
- the way the Central Administration of the Institution deals with any remarks and recommendations that the external experts pointed out in the External Evaluation of Academic Units

Do you wish to make any comment on a point not included above?

Main strengths

- (i) Undisputable quality of the individual NTUA faculty with international visibility.
- (ii) Despite stringent financial constraints imposed by the State, creativity and improvisation of students and faculty allow the program to survive.
- (iii) PhD graduates of NTUA typically shine and land high salaries in competitive positions in Industry and academic posts.

Main weaknesses

- (i) Availability of courses at the Ph.D. level varies across schools; and likewise Ph.D. requirements are non-uniform across schools;
- (ii) Sizeable part of the Ph.D. student body works on projects not related to their research and sometimes even perform administrative work or find non-NTUA employment to financially support their research, which also contributes to increasing the duration of their studies and the number of stagnant students to unacceptable levels.
- (iii) Inadequate funding to maintain research laboratories and support travel expenses of students attending scientific meetings and flagship conferences in their fields, which will also increase the much needed extroversion and internationalization of NTUA.

Do you wish to make any comment on a point not included above?

Individual meetings with selected graduate students revealed mixed feelings. The majority was overall satisfied with progress of their PhD program, and their relationships with their advisors. Main concerns expressed that facilities are not adequately maintained (no heat in the Winter and operational air conditioning in the Summer); seminars from visiting academicians and Industry representatives could be increased; limited access to specialized databases for publications; job fair with Industry representatives not allowed to take place on campus and no funding to facilitate career placement efforts; quality of meals in cafeterias has been fluctuating; occupied spaces by “political minorities” permeates feelings of insecurity and contributes to an overall feeling of spending minimal time on Campus; no real feeling of NTUA student community; medical support for un-insured is handled sub-optimally; and lack of grievance committee to handle student complaints reported.

Please decide in respect to the specific evaluation area (& 3.2.3):

	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

Excellence of individual faculty is without any doubt worthy of merit. Introducing PhD courses, Graduate School for monitoring progress and developing courses at the PhD level, centers of excellence, systematic selection and evaluation of students, and strategies across NTUA, would be main venues for improvement.

3.3 Profile of the Institution under evaluation - Conclusions and recommendations

*Please complete the following sections regarding the overall **profile of the Institution under evaluation**:*

- *Underline specific positive points:*

P1) NTUA breathes quality, thanks to the “cream of the crop” of its top-notch faculty and students (about 10-20% of the total).

P2) The leadership (rectors, council, and school deans) are skilled, creative, and willing to develop strategies and action plans to solve well-documented and appreciated problems that are perplexed by partisan politics prevalent on campus, the financial constraints of the State, and the low-moral omnipresent throughout the country.

P3) The overall ambiance among leadership, faculty, administrative staff and students, appears to be working toward the common good.

P3) Breadth, depth, and diversity of the subjects taught and the research carried out is excellent; likewise, links with Industry are commendable, and outreach efforts to benefit the local community, the nation and the society, are outstanding.

- *Underline specific negative points:*

N1) NTUA central and senate-driven collective vision and strategy to deal with chronic weaknesses and institute much needed organizational policies, does not come across crystal and clear.

N2) Hostage status of partisan politics, in-breeding, introversion, and excessive reliance on NTUA’s brand name” are impeding factors toward implementing the long overdue shape-up of the curriculum, identification of peer institutions, adoption of working practices followed at top institutions worldwide, clear identification of where NTUA wishes to go, and what role is poised to play in the international arena.

N3) Challenges of occupied buildings, stagnant students, low student attendance of classes, lack of yearly evaluations of individual faculty, and implementation of measures to regulate suboptimum performance metrics.

N4) Inadequate funding, hires of administrative staff with inappropriate skill sets, and non-commensurate numbers of incoming students versus number of new hires, controlled and/or imposed by the State.

- *Make your suggestions for further development of the positive points:*

s1) Leverage top-notch quality of students, faculty, and the Council's expertise to capitalize on intellectual capital and fund raising efforts from external non-State sources.

s2) Include administrative staff input to internal evaluation efforts as well as planning and strategizing.

s3) Explore revenue generators for M.Sc. programs taught in English.

- *Make your suggestions on needed steps for improvement:*

S1) Institute central coordination for a uniformly reduced-size undergraduate curriculum with prerequisites; and introduce checks and balances to ensure meritocracy in hiring faculty and staff.

S2) Likewise, establish uniform standards through the establishment of a Graduate School to overlook admission, monitoring, and quality assurance of M.Sc. and Ph.D. programs.

S3) Establish a student centre to host a) tutors for classes; b) academic advisors also for student placement; c) mobility to and from international destinations; and d) a grievance committee.

S4) Explore creative means of preventing occupation of buildings, ameliorate the effect of non-performing faculty, lower the duration of studies, minimize stagnant students, and above all invent ways to control the influx of higher than possible to educate incoming students imposed by the government (to this end, build on efforts pioneered by the School of Architecture).

S5) Develop incentives to increase success rate of external funding, and thus improve NTUA's self-sustainability.

4. INTERNAL SYSTEM OF QUALITY ASSURANCE

4.1 Quality Assurance (QA) Policy and Strategy

Please comment on:

- the Institution's policy and goals regarding QA and Improvement
- whether the Institution has developed a specific system of QA
- how the Institution's internal QA system has been organized
- how the students and staff of the Institution are protected from biased interventions and discriminations
- whether a detailed implementation guide has been put together, containing an analysis of the QA system's operating procedures
- the involvement of students in QA
- how the Institution evaluates the effectiveness of its QA system regarding the achievement of its goals

Do you wish to make any comment on a point not included above?

Kudos to NTUA leadership (Rectors, Council, and Deans of all Schools) for recognizing the value of QA, and for taking concrete steps toward permeating a QA culture on Campus. MODIP and OMEAs function relatively well in a short interval, and are open to cross-fertilizing ideas from top to bottom. Policies and strategies have placed more emphasis on QA pertaining to teaching and learning, and somewhat less toward research and administrative performance. For instance, administrators and stakeholders have no indirect input to the internal evaluation documents.

Although the EEC had no first-hand evidence, the QA system must be regularly updated "on demand" and its organization must have shaped up quickly – an important step for the higher education since NTUA typically plays a role model for other institutions in Greece. Future updates should mention how past evaluations influence policies and strategies. Likewise, feedback from and to OMEAs should indicate how policies and strategies affect operations at the school level.

A professor acting as "student-advocate" is planned to be in place shortly, for protecting student rights, even though a grievance committee with student and faculty representatives would seem more prudent to consider. The implementation guide for QA is not detailed at this point, and thorough analysis of QA results is not complete yet. It is somewhat unclear whether and how QA analytics are utilized in designing, monitoring, and evaluating the academic and research programs. Their effectiveness could benefit from setting up academic benchmarks along with a list of peer institutions to serve as lines of comparisons solidifying where NTUA wants to go in setting up its short- and long-term goals.

Please decide in respect to the specific evaluation area (&4.1):

	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

With the will, effort, and awareness of the QA granted, these first steps taken by NTUA's MODIP and OMEAs are commendable. However, there is ample room for improvement on clarity and specificity of procedures followed in collecting and analysing the data vis-à-vis privacy constraints, policy and strategy at the central administration level, benchmarking of the quality goals set, and establishing lines of comparison with peer institutions in Europe, and worldwide.

4.2 Design, approval, monitoring and evaluation of the study programmes and degrees awarded

Please comment on:

- whether the learning outcomes have been clearly formulated and whether they have been published
- whether the programmes are designed in such a way as to involve students and other stakeholders in the work
- how the achievement of learning outcomes is monitored
- whether there is a published Guide regarding the organization of programmes of study
- whether the ECTS system is taken into consideration and implemented
- whether there is a periodic evaluation of the programmes according to set procedures and criteria aimed at safeguarding their consistency and regular updating
- the student participation in the QA procedure of the study programmes
- whether the programmes include well-structured international mobility and -where appropriate- placement opportunities

Do you wish to make any comment on a point not included above?

MODIP and OMEAs of NTUA Schools design QA metrics and provide data for program as well as degree evaluation. These are reviewed and updated annually by Schools and eventually by the Senate of NTUA, before being published and publicized electronically.

There is only a single school (Chemical Engineering) making a serious effort to abide with the ECTS system, while avoidance of overlapping courses and incorporation of pre-requisites is only partially met at the time of this evaluation. Different from most Greek Universities, 8 (out of 9) NTUA schools not even mention ECTS units in their websites, nor they account for ECTS units in the students' grade point average. In fact, websites of individual Schools and particularly the central NTUA website falls very short of its reputation. Especially, its English version is rather poor and will eventually hurt the brand name of the Institution.

Albeit at a relatively low percentage, there is student participation in QA guidelines through questionnaires. Input from various stakeholders and possibly alumni could be made more systematic.

Means of assessing learning outcomes are not transparent in the QA material. Cross-pollination of results from QA data analytics has not yet occurred to clearly demonstrate how they affect under graduate and graduate programs as well as degree requirements.

<i>Please decide in respect to the specific evaluation area (&4.2):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

Only sporadic efforts by only one School to adhere by the ECTS system, and maintain published guidelines for their programs and degree requirements. Additional suboptimum aspects include mobility of international students visiting NTUA, the coursework load and extravagant duration of exams periods and studies that lead also to stagnant students, all testify that learning outcomes are not clearly accounted for in the design and evaluation process, while administrative staff, and Industry could have presence on Campus, and measurable input to the programs and degrees awarded.

4.3 Teaching and learning - Assessment by students

Please comment on:

- whether multiple and coherent learning paths are provided according to the needs of students in the Institution's Departments / Faculties
- how proper guidance and support is offered to students by the Departments / Faculties' teaching staff
- whether students are informed clearly and in detail regarding the strategy of evaluation that is implemented for their programme of study, the exams or other methods of assessment they will be subjected to, what is expected of them and which criteria will be applied for the evaluation of their performance
- whether there is a formal procedure for addressing complaints and objections by students in the Departments / Faculties of the Institution

Do you wish to make any comment on a point not included above?

NTUA curriculum scores high in the breadth of learning pathways it provides to its students. Coherence is a prevalent attribute of the programs that goes as far as creating considerable overlap among courses, and sometimes even across Schools. Students interviewed expressed their appreciation to the advising provided by their teachers. However, the number of students are too many for the faculty size (a hurdle placed by the State), while funds are inadequate to maintain a learning-conducive classroom environment (space is an issue in certain cases, along with maintenance of air-conditioning and laboratories).

For the most part, there is sufficient information provided to students regarding their performance evaluation including homework, tests, and lab exercises. Midterm exams are not common to all Schools and classes. Exam periods are excessively long, and occasionally final exams are not announced ahead of time. Use of multimedia and e-learning tools could be leveraged to reach outside Greece, and promote internationals to participate in NTUA's programs of excellence.

There is psychologist on duty to help students (paid by ELKE). Although student requests and complaints are addressed by advisors or the Dean of each school, systematic provision of student advising on courses, management of stress associated e.g., with exams, and job placement opportunities, will all be welcome. Such services could be provided by orientation of freshmen by seniors, as well as through regular tutoring teams of graduate students, and the career placement office. In addition to the planned "students' advocate," consider instituting an NTUA-wide grievance committee to address objections and complaints by students.

<i>Please decide in respect to the specific evaluation area (&4.3):</i>	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

On the positive side, students assess their breadth of learning as excellent, and likewise for their advising. Also commendable is the recent introduction of course syllabi in classes of certain Schools. Areas of improvement include efforts toward streamlining classes with overlapping content, maintaining high-quality classroom environment, incorporating e-learning pathways, and establishment of an NTUA-wide committee charged with complaints and objections by students.

4.4 Admission of students, progression and recognition of studies

Please comment on:

- whether the procedures and criteria for admission to the second and third cycle of studies are implemented with consistency and transparency
- whether there are clear and distinct procedures within the Departments/Faculties, as regards recognition of higher education degrees, periods of study and knowledge acquired at an earlier stage
- whether there are clear and distinct procedures of recognition of study periods and prior learning (including the recognition of non-formal and informal learning)
- whether there are clear procedures in place regarding the cooperation of other Institutions with national ENIC/NARIC centres for ensuring coherent recognition and mobility among programmes within / among Institution (s)
- whether students are provided with detailed information (e.g. Diploma Supplement) regarding the degrees conferred to them, the achieved learning outcomes as well as the framework, the level and the content of studies they successfully completed
- whether the Institution has in place processes and tools to collect, monitor and use information regarding student progression

Do you wish to make any comment on a point not included above?

Albeit not uniformly implemented across Schools, graduate student admission criteria and procedures were deemed adequate. These include recognition of higher education degrees earned, documented breadth and depth of coursework, and accounting for prior periods of study. Ability to acquire and provide student transcripts and course descriptions (including Degree Supplements) electronically is a major hurdle that NTUA has planned to address in the next 3-4 years. Compliance with national ENIC/NARIC centres for assuring coherent recognition and student mobility internationally is rather unclear.

Excess of incoming students dictated by the State as well as the State's loose attitude toward stagnant students seriously hurts the academic mission of a potentially research jewel University that NTUA aspires to become in par with the illustrious subset of its graduates. Adding to these, cuts of the State budget and reduced hires lowering further the faculty-to-student-ratio, jeopardizes NTUA's ability to supply the nation with top-notch Engineers, and places NTUA programs at a disadvantage in today's competitive arena of institutions worldwide. It will be useful to aim at an NTUA-wide code of practice to analyse and evaluate progress at the M.Sc. and Ph.D. levels, e.g., through uniform admission criteria and documents, as well as qualifying exams and thesis proposals.

<i>Please decide in respect to the specific evaluation area (&4.4):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

This rating could be positive as far as admission of top undergraduate students is concerned, since the number of incoming students is basically dictated by the State. However, at the M.Sc. and Ph.D. levels improved filtering is expected for admitted students; in certain Schools qualifying exams and thesis proposals are not common practice; while obtaining transcripts and degree information especially in electronic form has high priority in the list of desiderata for a long time.

4.5 Quality Assurance as regards the teaching staff

Please comment on:

- how it is guaranteed that the vacancy notices and recruitment of teaching staff include procedures which provide assurance that all new teaching staff members have at least the basic teaching skills
- opportunities offered to the teaching staff for their professional/scientific advancement
- how potential weaknesses of the teaching staff are identified as regards the delivery of their teaching courses
- the Institution's procedures for the support of new teaching staff as regards the teaching and evaluation methods
- how scientific activity is assessed and encouraged among the teaching staff in order to strengthen the connection between education and research
- the procedures in place so that the teaching staff members receive the necessary feedback on their personal performance as well as on the opinion of students
- whether a regulatory framework is in place for the investigation of disciplinary and academic misconduct of the teaching staff

Do you wish to make any comment on a point not included above?

The NTUA faculty recruiting and hiring process follows national guidelines. Student feedback is the main tool for identifying teaching weaknesses, and individual Deans make efforts to rectify cases of suboptimum teachers. Although there is no possibility of further corrective action of tenured faculty, the EEC was told that faculty members care about student evaluations because they are occasionally used in their promotion. Only 15% of the students participate in assessing the program of studies – a percentage that should be certainly improved.

The EEC recommends discussion of the course evaluation results between students and their instructor after the evaluation. Open publication of the evaluation results is also encouraged.

Opportunities offered to teaching staff for their professional/scientific advancement are Erasmus program exchanges and sabbatical leaves. As the research activities of individual faculty are an essential part of their promotion, they are implicitly encouraged at the personal level. Although NTUA traditionally has well equipped laboratories, funding is not used to strengthen these. The EEC suggests systematic promotion of research activities in order to strengthen the connection between education and research through links between teaching and research programs. The IER report states that NTUA provides institutional and legal means of dealing with disciplinary and academic misconduct of teachers as provisioned by Greek legislation.

<i>Please decide in respect to the specific evaluation area (&4.5):</i>	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

Student evaluation on courses is prevalent, but with rather low participation especially on the program questionnaire. Quality assurance of teaching staff could be certainly improved.

4.6 Learning resources and student support

Please comment on:

- whether there are procedures for the systematic monitoring, evaluation, review and improvement of the appropriateness and effectiveness of supporting services available to students
- the available support services in regard to Libraries, Information systems and infrastructure
- the procedure in place for offering individual assistance (counselling and tutoring) to students

Do you wish to make any comment on a point not included above?

NTUA does not have procedures in place for systematic monitoring, evaluation, review, assessment, benchmarking, and upgrading effectiveness of supporting services available to students, libraries, information systems, and infrastructure, to name a few. The EEC recommends yearly student evaluation of supporting services, including the library, counselling office, dormitories, and food services.

There is medical office and psychological support services are covered by ELKE. There is institutionalized counselling and tutoring position (one for every 20 students), but the students indicated that they not aware of this service, and in case of need for counselling, they resort to the Dean of the School or a Deputy Rector.

The Liaison Office provides minimal student support activities, but its effectiveness is limited due to lack of personnel. The EEC recommends hiring skilled staff to serve the Liaison Office, the Erasmus exchange Office, and the Practical Training Office.

The EEC had the opportunity to learn from the students and the alumni their satisfaction with the educational infrastructure and support services offered, but also their ignorance about many services that are either unaware of, or, they are under-utilized by students.

Please decide in respect to the specific evaluation area (&4.6):

	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

NTUA provides support services for its students, including libraries, IT, medical services, food services and dormitories. However, QA for such services is somewhat lagging; e.g., students have difficulty seeking advice and counselling, although this has been institutionalized formally.

4.7 Information Systems for Recording and Analysing Data and Indicators

Please comment on:

- whether the Institution possesses reliable means for collecting, analysing and utilizing valid information in respect to key performance indicators, the profile of the student population and student progression, success and drop-out rates
- whether the Institution possesses reliable means for collecting, analysing and utilizing valid information regarding its other functions and activities
- whether the Institution collects information about student satisfaction with their programmes of study and the career paths offered to graduates
- whether the Institution seeks comparison with other similar establishments within and beyond the European Higher Education Area, with a view to developing self-awareness and finding ways to improve its operation

Do you wish to make any comment on a point not included above?

A QA information collection system has been prepared. Partial data collection was mentioned and the system is operational, but not utilized yet because not all data is available. The EEC recommends to make every effort to bring the QA information system in full use, and also connect it with other information systems already in place, as soon as possible.

Although there is no formal mechanism for collecting metrics on student satisfaction regarding the programs of study, the students and alumni that the EEC met were generally satisfied. Students and faculty informed the EEC that the participation in student satisfaction surveys is low due to lack of time, low interest, and insufficient information about the results and impact. School Deans considered hard-copy evaluations that appear to improve participation and better secure privacy.

Individual Schools (such as Civil Engineering) seek comparisons with peer institutions within and beyond the European Higher Education cluster, as confirmed by presentations of their rankings assessed by various organizations. Meanwhile, those rankings are based mostly on prestige and not in QA evaluations with an eye toward developing self-awareness, and finding ways to improve the overall NTUA operation. The Institution should utilise the QA system for comparisons with other higher education institutions within and beyond the European Higher Education cluster, with the goal of strengthening self-awareness and finding possible ways to continuously improve metrics at institutional and individual levels, in terms of programs of studies, teaching, and research.

Recognizing inefficient operation of the alumni office, the EEC recommends development of a formal system to monitor the paths of all NTUA graduates. MODIP should also follow the overall progress of students in their studies (progress rates, success rates in the examinations, drop-out rates, graduation rates, time to graduation, and length of examination periods), in order to recommend procedures to improve deficiencies.

<i>Please decide in respect to the specific evaluation area (&4.7):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

Although the QA system software for collecting relevant information is in place, it is not yet in full operation. Indeed, from the multitude of entries planned, only student evaluations and data for full professors have been included so far.

4.8 Dissemination of information to stakeholders

Please comment on:

- how the Institution sees to the publicization of information on the programmes offered, the expected learning outcomes, the degrees awarded, the teaching, learning and assessment procedures it uses and the learning opportunities it offers to students
- whether the information regarding the Institution's offered programmes of study is available in English or in other languages
- whether the teaching staff's CVs are included in the publicized information, both in Greek and in English

Do you wish to make any comment on a point not included above?

The NTUA central website and those of individual Schools serve the purpose of disseminating information, including Study Guides of degree programs, expected learning outcomes, teaching,

learning and assessment procedures, along with teaching staff curriculum vitae. Quick inspection of the system revealed major information missing (e.g., ECTS maps of courses in most Schools), and a number of “dead links.” Minimal information is available in the English-version of all websites. Each School has each own approach to publicizing information in its own website with no unifying format across NTUA.

CVs of some faculty are included in the publicly information in non-uniform style and length. Many CVs are not available even in the form of brief bios, and when available they are not easily accessible by students, enterprises and other stakeholders that wish to establish fruitful contacts.

The EEC recommends development of a uniform style in disseminating the programs offered, the expected learning outcomes, the degrees awarded, the teaching, learning and assessment procedures, the educational and research opportunities available to students, along with short CVs of faculty, to facilitate navigation of stakeholders and easy access to the information sought.

The website of DASTA (Γραφείο Διασύνδεσης – Εξυπηρέτησης Φοιτητών και Νέων Αποφοίτων) could offer a main venue for disseminating information to stakeholders and assist students and alumni. The current URL <http://career.central.ntua.gr/> is maintained by one administrative staff, but according to student and alumni reports it is inefficient and generally not useful. An improved version of it, could better link NTUA with the community, and help students in their job hunting efforts. It could also connect NTUA with enterprises and even provide opportunities for students to launch their own business. The English version of this website could further facilitate connections of NTUA with international stakeholders.

<i>Please decide in respect to the specific evaluation area (&4.8):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

NTUA website should be markedly improved, and those of individual Schools can follow a uniform template and also allow for easy access to biographical information of faculty in both Greek and English. In addition, the DASTA website could use a major uplift.

4.9 Continuous monitoring and periodic review of the study programmes

Please comment on:

- the procedure followed with regard to assessment and periodic review of the contents of study programmes
- whether this procedure takes into account the changing needs of society
- whether this procedure takes into consideration the findings emanating from monitoring the graduates’ career paths
- the procedure with which the reviews take into account the students’ work load, the progress rate and completion of studies
- whether this procedure takes into account the cutting edge research activities in that particular discipline
- whether the involvement of students and other stakeholders is secured in the revision of the programmes

Do you wish to make any comment on a point not included above?

There is no systematic and formal QA procedure for periodic assessment and review of the academic programs of study at the undergraduate or graduate level. Continuous monitoring of the undergraduate programs of study is conducted through the procedures dictated by the Greek law

through specific committees, the General Assemblies of Schools, and NTUA's Faculty Senate. The EEC was informed that the programs are reviewed regularly and recommendations of the periodic external evaluations are taken into consideration. However, minority groups did not allow in certain cases to proceed with improvements. The Deans of most Schools mentioned that they plan to review their program of studies in 2016, and they will make efforts to reduce the number of courses required for their undergraduate degrees.

The EEC was informed that students were invited (officially and unofficially) to participate in the periodic review of the curriculum, but those reviews were disrupted by extremists and a few professors that were reluctant to accept changes. Input from external stakeholders including Industry was not systematically solicited. The EEC recommends development of a formal QA procedure for continuous monitoring and periodic review of the academic programs, taking into account input from all stakeholders involved.

<i>Please decide in respect to the specific evaluation area (&4.9):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

There is a need for a formal QA procedure to continuously monitor and periodically review study programs taking into account input from the stakeholders.

4.10 Periodic external evaluation

Please comment on:

- the procedure already planned by the Institution in order to deal with the observations of the Institutional External evaluation
- how the anticipated implementation of plans by Departments / Faculties is monitored in response to any comments included in their external evaluation and in the accreditation of their programmes

This is the first external evaluation of NTUA at institutional level. No plans were mentioned during the visit for means of dealing with the outcomes. External evaluations of individual NTUA schools were minimally accounted for, as corroborated by the absence of information in MODIP's report regarding the implementation of suggestions from school-level external evaluations. Implementing the recommendations of these evaluations should be monitored by MODIP and the OMEA of each School. The EEC requested to meet with Deans of all Schools who estimated the percentage of recommendations by external evaluators fulfilled so far, to be about 60- 80%. NTUA-level actions to e.g., streamline the curricula were at the drawing board, while those State engagement were not considered.

The EEC had difficulty to grasp the purported steps taken by the NTUA leadership to follow the recommendations and lessons learned from the periodic external evaluations. At this point, it is unclear how well prepared NTUA is for the upcoming accreditation of its programs.

<i>Please decide in respect to the specific evaluation area (&4.10):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

NTUA does not have in place a system of monitoring external evaluations, but has taken steps to this extent.

4.11 Internal System of Quality Assurance – Conclusions and recommendations

*Please complete the following sections regarding the **internal system of quality assurance**:*

- *Underline specific positive points:*

P1) NTUA values QA, and took steps toward permeating a QA culture on Campus.

P2) MODIP and OMEAs function well in a short interval and are open to cross-fertilizing ideas.

P3) Admission in undergraduate, M.Sc. and Ph.D. levels is transparent.

P4) NTUA seeks comparisons in rankings with peer institutions in Greece, Europe, and worldwide.

P5) The alumni office of NTUA tracks the paths of its graduates.

P6) An information collection system for QA has been implemented.

- *Underline specific negative points:*

N1) Input from external stakeholders including Industry, was not solicited systematically.

N2) NTUA does not have procedures for systematic monitoring, evaluation, review and assessment of how effective student supporting services are.

N3) The website of the Institution is neither user friendly nor uniform across schools, and can benefit from major updates to include short CVs of all faculty, and appeal to international browsers.

- *Make your suggestions for further development of the positive points:*

s1) Improve clarity and specificity of procedures followed in collecting and analysing QA data, policy and strategy at the central administration level, and also benchmark the QA goals set in comparison with peer institutions in Europe, and worldwide.

s2) Raise admission standards in M.Sc./Ph.D. levels through qualifying exams and thesis proposal.

s3) Make transcripts and degree information available in electronic form.

s4) Systematically promote research activities to strengthen education and research through links between teaching and research programs.

s5) Develop a formal system to monitor the paths of all graduates and enhance the alumni office.

s6) MODIP should systematically monitor the overall progress of students in their studies, and continuously recommend procedures to address deficiencies.

s7) Ensure that services of the DASTA Liaison, the Erasmus exchange, and the Practical Training office are fully provided.

s8) Make every effort to bring the QA information system in full use, and it is linked with information systems already in place, at soon as possible.

- *Make your suggestions on needed steps for improvement:*

S1) Implement a formal QA process for continuous monitoring and periodic review of the study programs taking into consideration input from all stakeholders involved.

S2) Perform yearly student evaluations of all supporting services.

S3) Revamp NTUA's website and those of individual Schools to include course equivalents expressed in ECTS units and short CVs of all faculty in uniform style, both in Greek and English.

S4) Develop a MODIP-driven process to follow up and deal with feedback received by external evaluations at all levels (Institutional, School, and Accreditation bodies).

5. OPERATION OF THE CENTRAL ADMINISTRATION OF THE INSTITUTION

5.1 Central Administration Services of the Institution

Please comment on:

The operation of the central administration services of the Institution in regard to the:

- Special Account for Research Funds (SARF): SARF functions are commendable.
- Financial services: Adequate, and with steps in the right direction with recent upgrades in electronic payments and reimbursements
- Supplies department: Adequate.
- Technical services: They appear to be partially adequate; however, the EEC identified a number of campus areas/buildings that require more attention/cleaning.
- IT services: Adequate.
- Student support services: Partially adequate with more notable problems pointing to the absence of student ombudsman's office. The Rector mentioned that such an office will start functioning in September 2016.
- Employment and Career Centre (ECC): Albeit growing and broadening its activity, EEC is mainly confined to student advising and help with preparation of their CVs.
- Public/International relations department: It is virtually non-existent.
- Foreign language services: It does not appear to operate as a separate unit. Establishment of a center of foreign languages is recommended.
- Social and cultural activities: Limited to sports events, festivities and humanitarian efforts. There is strong need of more proactive presentation of education and scientific work produced at NTUA.
- Halls of residence and refectory services: Due to time limitations, the EEC did not get the chance to visit student dormitories. The more recently built dormitory seems to serve students really well. The second much older one needs major upgrade as soon as possible. NTUA leaders informed the EEC that a plan for renovating the building is under way.
- Institution's library: Very well equipped.

<i>Please decide in respect to the specific evaluation area (&5.1):</i>	Tick
Worthy of merit	
Positive evaluation	
Partially positive evaluation	X
Negative evaluation	

Justify your rating:

While all services along with their supporting offices are in place, it appears that some could function better. Examples include the Foreign languages office, the Public/International Relations office, Employment and Career Centre (ECC), and the planned ombudsman's office. Given the sufficient number of administrative staff, internal reallocation could be well motivated to this end.

5.2 Operation of the Central Administration of the Institution – Conclusions and recommendations

Please complete the following sections regarding the **operation of the Institution's central administration** :

- *Underline specific positive points:*

P1) The internal system for QA is in the right track, and its impact will appear in future actions.

P2) Administrative staff reacted very well during the past two years of uncertainty when most of NTUA's administrative personnel was placed in an in-active or available-while-out of work status. (Διαθεσιμότητα)

P3) Central NTUA administration, the academic faculty administration, the students and the non-academic staff cooperate to ensure mutual understanding capable of withstanding and overcoming challenges that arise from the stringent economic and political situation in Greece now days.

- *Underline specific negative points:*

N1) Faculty, students, but not administrative staff participate in the internal evaluation groups.

N2) Outdated and inefficient organizational chart in certain places; e.g., the General Administration of Facilities is split into two units, while it could easily be merged into one.

N3) Inadequate tracking and leveraging of NTUA alumni.

N4) The Public/International relations office should get organized and function better

- *Make your suggestions for further development of the positive points:*

s1) Create surveys designed to estimate the degree of work satisfaction and level of contribution to the Institution by the administrative staff.

- *Make your suggestions on needed steps for improvement:*

S1) Include students and non-academic staff in the evaluation assessment system.

S2) Institute a central authority/committee to monitor the professional development of alumni.

S3) Introduce a central office to capitalize on NTUA's properties (halls and real estates).

S4) Improve distribution of employee expertise across administrative units.

S5) Create a central alumni managing office to facilitate alumni support (in financial or publicity matters.)

S6) Eliminate administrative units that may exist on paper, but remain largely inactive.

6. CONCLUSION AND RECOMMENDATIONS

In connection with the

- general operation of the Institution
- development of the Institution to this date and its present situation
- Institution's readiness and capability to change/improve
- Internal system of Quality Assurance of the Institution

please complete the following sections:

- *Underline specific positive points*
 - For the most part, NTUA appears to be well organized. It enjoys outstanding reputation thanks to a subset of its top-notch students and faculty that pursue a broad range of high-caliber research. Over the years, such a top-notch human capital has made major contributions to the Nation, and serves as shining ambassadors of Greek Science and Technology worldwide.
 - NTUA leadership has a list of well-defined goals in academic, administrative, and research fronts, along with laudable strategic initiatives to achieve these goals.
 - The leadership has identified strengths and weaknesses, and has plans on the board to ensure the quality of its academic and research programs.
 - Similar to other Greek Universities, commendable individual efforts contribute to addressing challenges associate with a) adaptation to changes in higher education; b) legal obstacles; and, c) staff and faculty congruence towards strategic goals.
 - The leadership (Council, Rector, Deputy Rectors, and Deans) articulated a vision, and documented strategies along with action plans to address a subset of long-standing problems originating from in-breeding, intervention of the State in University governance, and hostage status of partisan politics, that recently accentuated by the stringent finances, and the low moral omnipresent throughout the country.
 - The overall ambiance among leadership, faculty, administrative staff and students, is working toward the common good.
 - Breadth, depth, and diversity of the subjects taught and the research carried out is excellent; likewise, links with Industry are commendable, and outreach efforts to benefit the local community, the nation and the society, are outstanding.
 - NTUA recognizes QA benefits, and took steps to permeate a QA culture on Campus, including the paying attention to School rankings, and the implementation of a QA information collection system with metrics and benchmarks.

- *Underline specific negative points*
 - State intervention in University governance, partisan politics, in-breeding, and high reliance on the "brand name" of NTUA, are all impeding factors toward the needed shape-up of the curriculum to reduce load and avoid overlapping courses, recognition of peer institutions, working practices followed by top institutions worldwide, clear identification of where NTUA wishes to go, and what role is poised to play in the international arena.
 - Challenges of occupied buildings, stagnant students, low attendance of classes, excessive exam periods, suboptimum exposure of ECTS equivalents, lack of yearly evaluations of individual faculty and measures to regulate suboptimum performance metrics.
 - Inadequate funding, hires of administrative staff with inappropriate skill sets (especially in the Public Relations and International offices), lack of e-services for faculty and students (including transcripts and degree information), and non-commensurate numbers of incoming students versus number of new hires, controlled and/or imposed by the State.
 - Input from external stakeholders including Industry is neither solicited nor accounted for in shaping up academic and research efforts (even Industry representatives cannot participate in a job fair on the NTUA campus).
 - No procedures in place to systematically monitor, evaluate, review, and assess appropriateness and effectiveness of supporting services available to students.

- Rather poor NTUA-central website, especially in its English version, and non-uniform School websites, make it hard to find information, including short CVs of all faculty.
- Suboptimum monitoring and leveraging of NTUA alumni.
- Below par efforts to accommodate individual with special needs, and address environmental and sustainability concerns across campus.

Make your suggestions for further development of the positive points:

- Streamline goals and initiatives, to end up with a realistic and feasible timetable.
- Institute consistently QA processes for faculty and staff, to include a 'job description' for administrative staff along with a 360-degree feedback,' https://en.wikipedia.org/wiki/360-degree_feedback, as permitted by law.
- Build on EPISEY's success to establish additional Institutes in research areas of growth, and develop a viable plan to ensure their financial self-sustainability.
- Harmonize QA metrics for faculty, and ensure uniformity in teaching and research guidelines and requirements across Schools, at both undergraduate and graduate levels.
- Leverage the high quality of students, faculty, and the Council's expertise to capitalize on intellectual capital and fund raising efforts from external non-State sources.
- Include input from administrative staff in the internal evaluation, but also in planning and strategizing at the NTUA level.
- Generate revenue from M.Sc. tuition fees of programs taught in English.
- Promote and reward research and its links with NTUA's educational mission.
- Include teaching and research benchmarks from peer institutions in the QA system.
- Develop a formal system to track alumni and engage them through the alumni office.
- MODIP should systematically monitor metrics to assess progress of students in their studies, and propose procedures to cope with deficiencies.
- Improve services of DASTA, Liaison, Erasmus exchange, and a Practical Training offices.
- Bring the QA information system in full operation, and link it with information systems already in place, as soon as possible.
- Create surveys designed to estimate the degree of work satisfaction, and contributions of administrative staff to the overall operation of NTUA.

Make your suggestions on needed steps for improvement

- Institute central coordination for a uniformly reduced-size undergraduate curriculum.
- Likewise, establish uniform standards through the establishment of a Graduate School to overlook admission, monitoring, and QA of M.Sc. and Ph.D. programs.
- Establish a student centre to host: tutors for classes; academic advisors for student placement; mobility to and from international destinations; and a grievance committee.
- Explore creative means of preventing occupation of buildings, ameliorate the effect of non-performing faculty, lower examination period as well as the average duration of studies, minimize stagnant students, and above all invent ways to control the influx of higher than possible to educate incoming students imposed by the government (to this end, build on efforts pioneered by the School of Architecture).
- Give incentives to increase success rate of external funding and thus improve NTUA's self-sustainability.
- Obtaining transcripts and degree information in electronic form is high priority.
- Revamp NTUA's central website, and all School websites to include (similar to most Greek Universities, ECTS units appearing explicitly in Course Guides), and adopt a uniform appearance.
- MODIP should develop processes to account for and assure implementation of changes suggested by external evaluations.
- Form a committee to look after investment and revenue generation possibilities from NTUA property.
- Ensure that future administrative staff are hired based on meritocracy and possess the skillset for the post of the relevant unit.

6.1 Final decision of the EEC

<i>Please decide in respect to the overall Institutional evaluation:</i>	Tick
Worthy of merit	
Positive evaluation	X
Partially positive evaluation	
Negative evaluation	

Justify your rating:

All in all, the majority of assessment categories received a positive evaluation, which explains the aggregate score of this evaluation. It is worth stressing that the leadership is well aware of NTUA's strengths, and recognizes the challenges facing their efforts to overcome the identified weaknesses. NTUA appreciates the value of QA, and has put forth measurable efforts to cross-pollinate a QA culture, but full implementation of a QA system should take top priority in NTUA's list of desiderata, especially in view of the upcoming accreditation process.

The Members of the Committee

NATIONAL TECHNICAL UNIVERSITY OF ATHENS

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