



ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
HELLENIC REPUBLIC



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Accreditation Report for the New Postgraduate Study Programme of:

Infrastructure and Construction Project Management

Institution: National Technical University of Athens

Date: 29 April 2023



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



Report of the Panel appointed by the HAHE to undertake the review of the New Postgraduate Study Programme **Infrastructure and Construction Project Management** of the **National Technical University of Athens** for the purposes of granting accreditation.

ACRONYMS

ECTS:	European Credit Transfer and Accumulation System
EEAP:	External Evaluation & Accreditation Panel
EHEA:	European Higher Education Area
ENQA:	European Association for Quality Assurance in Higher Education
ESG:	Standards and Guidelines for Quality Assurance in the European Higher Education Area
EUA:	European University Association
GDPR:	General Data Protection Regulation
HQA:	Hellenic Quality Assurance & Accreditation Agency in Higher Education
HAHE:	Hellenic Authority for Higher Education
HCIC:	Hellenic Construction Industry Council
HEIs:	Higher Education Institutions
IM:	Integrated Master
IQAS:	Internal Quality Assurance System
ISO:	International Organization for Standardization
KPIs:	Key Performance Indicators
MSE:	Master of Science in Engineering
MOOCS:	Massive On-line Open Courses
NISQA:	National Information System for Quality Assurance in Higher Education (ΟΠΕΣΠ)
PSP:	Postgraduate Study Programme
PIPP:	Professional Interdepartmental Postgraduate Programme
QAU:	Quality Assurance Unit
USP:	Undergraduate Study Program

TABLE OF CONTENTS

Part A: Background and Context of the Review	5
I. The External Evaluation & Accreditation Panel	5
II. Review Procedure and Documentation	6
III. Study Programme Profile	8
Part B: Compliance with the Principles	9
Principle 1: Quality Assurance Policy and Quality Goal Setting for the New Postgraduate Study Programmes	9
Principle 2: Design and Approval of New Postgraduate Study Programmes	14
Principle 3: Student Admission, Progression, Recognition of Postgraduate Studies, and degree award	17
Principle 4: Teaching Staff of New Postgraduate Study Programmes.....	21
Principle 5: Learning Resources and Student Support	23
Principle 6: Initial Internal and External Evaluation and Monitoring of New Postgraduate Study Programmes	26
Part C: Conclusions	29
I. Features of Good Practice	29
II. Areas of Weakness	29
III. Recommendations for Follow-up Actions	30
IV. Summary & Overall Assessment	31

PART A: BACKGROUND AND CONTEXT OF THE REVIEW

I. THE EXTERNAL EVALUATION & ACCREDITATION PANEL

The Panel responsible for the Accreditation Review of the New Postgraduate Study Programme **Infrastructure and Construction Project Management** of the **National Technical University of Athens** comprised the following five (5) members, drawn from the HAHE Register, in accordance with Laws 4009/2011 & 4653/2020:

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

- 2. Prof. Emeritus, Nikolaos D. Katopodes**
University of Michigan, Michigan, United States of America

- 3. Prof. Emeritus, George K. Haritos**
University of Akron, Ohio, United States of America

- 4. Prof. Emeritus, Panagiotis (Pete) D. Scarlatos**
Florida Atlantic University, Florida, United States of America

- 5. Mrs. Despoina G. Boulogiorgou, Doctoral Student**
University of West Attica, Athens, Greece

II. REVIEW PROCEDURE AND DOCUMENTATION

The External Evaluation and Accreditation Panel (EEAP) met for the first time on 24 April 2023, following the first official meeting of the EEAP for the HAHE training session, in order to provide the required introductions of the team members and discuss the approach for the visit, the roles of the EEAP members, and the process to be followed. The EEAP Chair identified a series of documents to be reviewed prior to the site visit, and the members agreed to complete their review before the first meeting on Tuesday, 25 April 2023.

The onsite visit was conducted via online conference meetings. The visit took place on 25 April 2023. The Panel wrote the report over the following days (in total started 24 April 2023 and completed 30 April 2023) through collaborative meetings held online.

Initially, the EEAP met Prof. Boudouvis (Rector of the NTUA), who delivered a brief greeting. Then the EEAP had a meeting with the Vice-Rector/President of MODIP, Prof. D. Gintides (Head of the Department), Prof. N. Lagaros (Dean of the School of Civil Engineering) and Vice-Rector Prof. E. Sapountzakis (Director of Postgraduate Programme).

The next session involved members of the faculty charged with the accreditation efforts (OMEA) and those at the University level (MODIP), and Steering Committee representatives. The discussion focused on the degree of compliance of the Programme to the Standards for Quality Accreditation.

This was followed by a detailed presentation of the strategic plan developed for the Professional Interdepartmental Postgraduate Programme (PIPP) regarding the curriculum, the teaching staff and the research activities of the members of the teaching staff. The main topics of the discussion were professional development opportunities, mobility, competence and adequacy of the teaching staff to ensure learning outcomes, workload, and evaluation by students. Other topics discussed were the linkage between teaching and research, the teaching staff involvement in applied research, projects and research activities directly related to the Programme, and possible areas of weakness.

The presentation of the next part started with an online tour with other faculty members, including the heads of the various laboratories, participating in the “tour”. This occurred through a pre-recorded video. A review and discussion regarding the available facilities and learning resources, which allowed the EEAP to ascertain that the learning materials, equipment and facilities are adequate to ensure the successful delivery of the new Programme.

The following session involved employers and social partners of the program aiming to address the readiness of the graduates for the market, as well as to identify areas of cooperation between the engineering departments involved and the employers, and also the significance of the Programme to external stakeholders from the private and public sectors.

The day closed with two additional meetings: the first with OMEA and MODIP representatives to address any outstanding questions and the second with the Vice Rector along with the

OMEA and MODIP members, where additional questions were addressed, and finally a brief summary of the key findings was presented by the Chair of the EEAP.

Overall, the faculty and staff prepared a comprehensive visit program with well-organized presentations and exchanges. Everyone was open to discussion, eager to answer questions and show the EEAP both the strengths and the weaknesses of the programs.

A series of reports and other documents were provided to the EEAP prior to and during the visit.

It is apparent that the online discussion and meetings worked well and allowed for the completion of the EEAP program in a succinct manner. Clearly, however, the social interactions during an in-person visit can only improve further the overall approach, by providing additional insight on the various aspects of the Programme and allowing further, sometime informal, feedback and discussions.

III. STUDY PROGRAMME PROFILE

The PIPP entitled "Infrastructure and Construction Project Management" proposed by NTUA for this Accreditation Report, is new and at the same time the first PIPP, in application of Article 89 of Law 4957/2022 entitled "New Horizons in Higher Education Institutions: Strengthening of the quality, functionality and connection of HEIs with society and other provisions".

The duration of operation of the PIPP is planned for five (5) academic years, namely from the academic year 2023-2024 to the academic year 2027-2028. With a contract signed by NTUA and the GEK-TERNA Group of Companies, the latter undertook to be a full Funding Agency (Sponsor) during the five-year duration of the PIPP.

The PIPP caters for the training of (a small number) of staff of the Sponsoring Group of Companies GEK-TERNA as well as third natural persons, in accordance with paragraph 3 of article 89 of the above law. Specifically, it mainly accommodates young engineers who graduated in the last five years from a national university with a five-year duration of study.

The PIPP is subject to all the policies, rules, procedures and controls established and implemented by the NTUA during the conduct of its Master's Programs. PIPP is coordinated by the School of Civil Engineering of NTUA with the partnership of the Schools of Mechanical Engineering (NTUA) and Electrical Engineering and Computer Engineering (NTUA) for the interdisciplinary coverage of the known subjects that includes.

The purpose of the PIPP will be to specialize graduates of Higher Education Institutions, of the Funding Company GEK-TERNA Group of Companies, and young qualified graduate engineers of national universities with five years of study, in the modern methods and techniques of managing infrastructure and construction projects, with an emphasis on the necessary technical and administrative skills for the rational implementation on infrastructures. The new PIPP:

- will aim to utilize modern scientific concepts, to learn techniques related to all stages of the life cycle of technical projects, project programs and project portfolios, to the practice of new technologies.
- will cover all aspects of the infrastructure and construction industry and emphasize not only the technical, but also the economic, environmental, legal, and social dimension of infrastructure and construction projects, from the initial design to completion, of their implementation and operation.
- will be interdisciplinary given the highly interdisciplinary nature of the content of its studies. In addition to the NTUA's School of Civil Engineering, the Schools of Mechanical Engineering, Electrical Engineering and Computer Engineering, which have been operating for many years, the NKUA's Management and Business Administration (MBA) and Technical Financial Systems respectively, will also be invited to contribute.

PART B: COMPLIANCE WITH THE PRINCIPLES

PRINCIPLE 1: QUALITY ASSURANCE POLICY AND QUALITY GOAL SETTING FOR THE NEW POSTGRADUATE STUDY PROGRAMMES

INSTITUTIONS SHOULD HAVE INCLUDED IN THEIR STRATEGY THE DEVELOPMENT, ORGANIZATION, AND IMPLEMENTATION OF NEW POSTGRADUATE STUDY PROGRAMMES IN SPECIFIC SCIENTIFIC FIELDS AFTER INVESTIGATING THEIR FEASIBILITY AND SUSTAINABILITY.

INSTITUTIONS SHOULD IMPLEMENT A QUALITY ASSURANCE POLICY FOR THE NEW POSTGRADUATE STUDY PROGRAMMES AS PART OF THEIR STRATEGIC PLANNING.

THE QUALITY POLICY SHOULD BE DEVELOPED AND SPECIALIZED (WITH THE PARTICIPATION OF EXTERNAL BODIES) IN THE POSTGRADUATE STUDY PROGRAMMES OF THE INSTITUTION AND THE ACADEMIC UNIT. THIS POLICY SHOULD BE PUBLISHED AND ENFORCED BY ALL INTERESTED PARTIES.

By decision/s of the Senate, the Institutions should include in their strategy the issues of development of new postgraduate study programmes, which support the character, vision, mission, and strategic objectives of the Institution. The Institutional strategy should identify the potential benefits and possible difficulties or risks for the establishment of new graduate study programmes and plan all the necessary actions to achieve the goals as set. The Institution's strategic choices should be documented by specific feasibility and sustainability studies, especially for new postgraduate programmes.

In the case of offering PSP by distance methods, the Institution prepares and implements an e-learning strategy. The Institution's e-learning strategy is integrated into its overall strategy and identifies educational goals adapting to rapid technological changes and changes in pedagogical models. The Institution should include in its strategy the justification and feasibility as to why e-learning has been chosen as an appropriate learning strategy for the particular programmes of study in which it is applied.

In the context of e-learning, innovation strategies, the possibility of revising the program, the connection between research and learning (requiring knowledge of the latest innovations in order to choose the most appropriate means to achieve the learning outcomes) should be taken into account.

The academic unit's quality policy for new postgraduate programmes is harmonized with the Institution's strategy and is formulated in the form of a statement, which is made public and implemented with the participation of all interested parties. It bears the pursuit of specific goals, related to the assurance and improvement of the quality of the postgraduate study programmes offered by the academic unit. Indicatively, the academic unit's quality policy statement includes its commitment to the implementation of a quality policy, which will promote the academic character and orientation of the new postgraduate study program, its purpose and objectives, implement the goals and determine the means and the ways of achieving them, and will apply the indicated quality procedures, with the final aim of its continuous improvement.

For the implementation of this policy, the academic unit undertakes to implement quality procedures that will demonstrate:

- a) the appropriateness of the structure and organization of new postgraduate study programmes*
- b) the pursuit of learning outcomes and qualifications in line with the European and National Higher Education Qualifications Framework level 7.*
- c) the promotion of the quality and effectiveness of the teaching work at the PSP.*
- d) the suitability of the qualifications and the availability of the teaching staff for the PSP.*
- e) the drafting, implementation, and review of specific annual quality objectives for the improvement of PSP.*
- f) the level of demand for the acquired qualifications of the graduates in the labour market.*
- g) the quality of support services, such as administrative services, libraries, and student welfare services for the PSP.*
- h) the efficient utilization of the financial resources of the PSP that may come from tuition.*
- i) carrying out the annual internal evaluation and review of the quality assurance system for PSP with the cooperation of OMEA and MODIP of the Foundation.*

Relevant documentation

- The Institutional strategy for postgraduate studies, which includes a special strategy for e-learning as long as it is applied to the Institution's PSP
- Feasibility and sustainability studies for the new PSP
- Quality Policy of the academic unit for the development and improvement of PSP
- Quality Targeting of the academic unit for the PSP

Study Programme Compliance

Findings

The proposed Postgraduate Study Programme (PSP), Management of Infrastructure and Construction Projects, is the first attempt to offer a professional graduate program by a Greek university. The PSP is proposed as an interdisciplinary, multi-departmental program at the Master of Science in Engineering (MSE) level. The target audience is comprised of graduates of 5-year Engineering schools or equivalent, and the main goal is to provide the technical, managerial, and leadership skills that are necessary for carrying out large construction projects. The main goals of the PSP are:

1. To provide the students with an opportunity to apply their theoretical knowledge to practice;
2. To gain experience in the management of large projects;
3. To participate in interdisciplinary teams that are essential in the design and operation of infrastructure systems;

4. To become familiar with the financial and legal issues associated with construction projects;
5. To improve their leadership skills.

The proposed PSP is of critical importance to the construction industry, which is manifested by its commitment to fund this program and collaborate through the course work and the MSE thesis that is required for graduation.

The structure and organization of the PSP is excellent. The interdisciplinary course work will provide the graduates with unique skills that will make them leaders in the construction industry. The structure of the PSP is good, with the only possible weakness of a somewhat vague articulation of the admission process. The EEAP is sceptical of the prudence in allowing the involvement of the sponsoring company in the admission process. In addition, the current plan is to attract candidates immediately after their Dipl. Eng. Degree, and to limit admission to five years following graduation. Experience from similar programs in other countries indicates that candidates with work experience actually contribute significantly to the quality of professional programs and represent an asset to the feedback process of instruction.

The proposed PSP is ideally aligned with the learning outcomes and qualifications of the European and National Higher Education Qualifications Framework level 7.

The proposed course work has been selected carefully, the preliminary syllabi show a satisfactory quality, and offer a strong promise for the effectiveness of the instructional process.

The teaching faculty includes a sufficient number of experienced teachers and covers all the strategic areas of the PSP. The faculty are well qualified and show a clear enthusiasm for the new Programme. The only weakness is the predominance of senior faculty, which may prove challenging in the future, due to potential faculty retirements. The current composition of the teaching team does not offer junior faculty the opportunity for growth, interaction with industry, and mentoring by senior colleagues. International good practice also involves gender balance and diversity, equity, and inclusion (DEI).

There exists a plan for review of annual quality objectives for the improvement of the proposed PSP, however, this will have to be reassessed when the first year of operation is started. This is the very first of its kind PSP, and there is little experience for its assessment. It is strongly recommended that an Industry Advisory Board (IAB) be created as soon as possible, and meetings be scheduled each semester initially, followed by the most appropriate frequency approved by the IAB thereafter, to review and advise as to the effectiveness of the Programme.

The level of demand for the acquired qualifications of the graduates in the labour market is remarkable. The discussions of the Accreditation Panel (EEAP) with industry leaders indicate an extraordinary need for engineers that master not only technical knowledge, but also economic, team building, legal, and leadership skills.

The quality of support services, libraries, and student welfare services available for the proposed PSP appear to be adequate in the video presentation. Most of the EEAP members had an opportunity to visit the NTUA campus in the past, thus the video review did not present any issues. However, this process may not be sufficient in future evaluations of the program when specific outcomes will have to be examined.

There will be no tuition in the proposed PSP, which is a most welcome attribute of the program. The EEAP strongly believes that the Programme leaders should pursue additional funding to provide fellowship support to at least a fraction of the students. This will improve the quality of the candidate pool and raise the morale of the students.

The NTUA faculty of all the three departments involved in the proposed PSP have extensive experience in carrying out the annual internal evaluation and review of the quality assurance system for the PSP with the cooperation of OMEA and MODIP of the Foundation. Therefore, the EEAP is confident that this will be a smooth and effective process.

Analysis of judgement

A solid process has been established for ensuring the compliance of the proposed PSP. There are currently no data available to make a judgement, however, the necessary procedures are well articulated, thus the EEAP is confident that the reporting will make the judgement straightforward in the future.

Conclusions

The proposed PSP is excellent and addresses critical needs of the construction industry. The vision, goals, and objectives are well thought and articulated. The AP believes that with some modification, as previously elaborated, this will become a model professional PSP.

The proposed PSP is based on an excellent plan that needs to be followed meticulously and be continuously reassessed regarding its content, practices, and deliverables. The proposed PSP addresses critical needs of the construction industry and has the potential to become a prototype for other professional programs. The PSP carries the seal of approval of the faculty of NTUA, which guarantees the potential for high social achievement. At the same time, this introduces the added responsibility to maintain the high academic standards of NTUA, and to protect its legacy from expedient practices.

Panel Judgement

Principle 1: Quality Assurance Policy and Quality Goal Setting for the New Postgraduate Study Programmes	
Fully compliant	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

R1.1 The EEAP believes that the proposed PSP has a high potential for success, provided that the student admission process be revised to:

- a. allow potential candidates with considerable work experience in addition to standard requirements.
- b. limit the involvement of the funding company to an advisory role in the student admission process.

R1.2 The mix of faculty ranks needs to be revised to allow more junior faculty to participate in the PIPP, and to better conform to international DEI standards.

PRINCIPLE 2: DESIGN AND APPROVAL OF NEW POSTGRADUATE STUDY PROGRAMMES

INSTITUTIONS SHOULD DEVELOP THEIR NEW POSTGRADUATE STUDY PROGRAMMES FOLLOWING A DEFINED WRITTEN PROCESS WHICH WILL INVOLVE THE PARTICIPANTS, INFORMATION SOURCES, AND THE APPROVAL COMMITTEES FOR THE NEW POSTGRADUATE STUDY PROGRAMMES. THE OBJECTIVES, THE EXPECTED LEARNING OUTCOMES, AND THE EMPLOYMENT PROSPECTS ARE SET OUT IN THE PROGRAMME DESIGN. DURING THE IMPLEMENTATION OF THE NEW POSTGRADUATE STUDY PROGRAMMES, THE DEGREE OF ACHIEVEMENT OF THE LEARNING OUTCOMES SHOULD BE ASSESSED. THE ABOVE DETAILS, AS WELL AS INFORMATION ON THE PROGRAMME'S STRUCTURE ARE PUBLISHED IN THE STUDENT GUIDE.

The academic units develop their postgraduate study programmes following a well-defined procedure. The academic profile and orientation of the programme, the research character, the scientific objectives, the specific subject areas, and specialisations are described at this stage.

The structure, content and organisation of courses and teaching methods should be oriented towards deepening knowledge and acquiring the corresponding skills to apply the said knowledge (e.g. courses on research methodology, participation in research projects, thesis with a research component).

The expected learning outcomes must be determined based on the European and National Qualifications Framework (EQF, NQF), and the Dublin Descriptors for level 7. During the implementation of the programme, the degree of achievement of the expected learning outcomes and the feedback of the learning process must be assessed with the appropriate tools. For each learning outcome that is designed and made public, it is necessary that its evaluation criteria are also designed and made public.

In addition, the design of PSP must consider:

- the Institutional strategy
- the active involvement of students
- the experience of external stakeholders from the labour market
- the anticipated student workload according to the European Credit Transfer and Accumulation System (ECTS) for level 7
- the option of providing work experience to students
- the linking of teaching and research
- the relevant regulatory framework and the official procedure for the approval of the PSP by the Institution

The procedure of approval or revision of the programmes provides for the verification of compliance with the basic requirements of the Standards by the Institution's Quality Assurance Unit (QAU).

Relevant documentation

- Senate decision for the establishment of the PSP.
- PSP curriculum structure: courses, course categories, ECTS awarded, expected learning outcomes according to the EQF, internship, mobility opportunities.

Study Programme Compliance

Findings

The EEAP views positively the fact that the proposed PSP leading to a professional MSE degree offers an interdisciplinary approach that encompasses Civil, Mechanical, and Electrical Engineering, as well as Economics, Law, and leadership topics. If the program attracts qualified students from these disciplines, the EEAP expects that the graduates will have a set of unique skills when they join the labour market. The Programme will offer a unique learning experience to the students by exposing them to instructors with different backgrounds and experiences. In addition, the diverse disciplines of the first degree of the students will allow the formation of unique teams and extraordinary opportunities for practical projects.

The discussion of the EEAP with the stakeholders from the labour market and the sponsoring of the Programme by a major construction company promises that the Programme will maintain a close contact to new trends in technological advancements and regulations.

The proposed PSP curriculum is generally well-articulated and comprehensive, and the student workload is compliant with the European Credit Transfer and Accumulation System (ECTS) for level 7 (90 ECTS - 60 for lectures plus 30 for thesis). The EEAP would like to recommend that the teaching faculty consider new and emerging practices related to the use of advanced optimization methods, augmented reality techniques in construction, as well as current developments in artificial intelligence.

The option of providing work experience to students is not available in the proposed PSP. However, the required thesis work will likely involve a real-world project, which will be a close substitute with the exception of students' compensation.

The proposed PSP plans to link research with teaching in the proposed Programme mainly through the MSE thesis, and by using examples of research in the relevant courses. The EEAP positively views that most of the teaching faculty are active in research, and thus ensure the transfer of new knowledge from research to practice.

The departments involved in the proposed PSP have responded to previous external evaluations with diligence and provide a comprehensive assessment of the programs. The EEAP feels that the quality and tradition of excellence in the NTUA will be a sufficient guarantee for similar reviews in the future.

Analysis of judgement

The review of the proposed PSP found no significant shortcomings in the implementation plan and the approach for the assessment and improvement of the program. Therefore, there is a very high probability for success once the program begins admission and instruction of the first cohort of graduate students.

Conclusions

Although this is a program that needs to be approved for implementation, the EEAP feels that it should be deemed fully compliant with regard to its design and methods of assessment that are already in place.

Panel Judgement

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

Panel Recommendations

R 2.1 The teaching faculty should consider incorporating in the curriculum new and emerging practices related to the use of advanced optimization methods, augmented reality techniques in construction, as well as current developments in artificial intelligence.

PRINCIPLE 3: STUDENT ADMISSION, PROGRESSION, RECOGNITION OF POSTGRADUATE STUDIES, AND DEGREE AWARD

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

The Institution should have drawn up and published the internal regulations prescribed by law which, among other things, should regulate all matters of postgraduate studies from the beginning to the end of the studies.

Indicatively:

- Students' selection procedures and required supporting documents.
- The rights, obligations, and monitoring of student progress.
- Internship matters (if applicable) and scholarship matters.
- The procedures and conditions for preparing theses and dissertations.
- The process of awarding and recognizing degrees, the duration of studies, the conditions for promotion and ensuring the progress of students in their studies.
- The terms and conditions for enhancing their mobility.

In the case of offering the PSP with distance learning methods, the Institution should have a regulation for e-learning, which includes in particular the following topics:

- Services of the Institution to support e-learning.
- Course development and implementation methodology.
- Ways of providing the teaching work and variety of forms of teaching and assessment of the students
- General standard of course structure.
- Student support system.
- Supporting faculty/teachers with mandatory e-learning training for new staff members.
- Offered technological infrastructures of the Foundation.
- Student identity confirmation system (student identity check, assignment and exam writing process, security, and degree award issues).
- The institution should establish rules to provide appropriate access and ensure the participation of students affected by disability, illness, and other special circumstances.
- With the regulation on e-learning, ethical issues are regulated, such as those of protecting data privacy or intellectual property rights and rules to deal with fraud.

All of the above must be made public in the context of the Study Guide.

Relevant documentation

- Internal regulation for the operation of the Postgraduate Study Programme.
- Special regulation for the implementation of e-learning if the PSP is offered by distance methods.
- Research Ethics Regulation.
- Regulation of studies, internship, mobility, and student assignments.
- Degree award template.

Study Programme Compliance

Findings

This new Professional Master's Degree Program in Management of Infrastructure and Construction Projects, is aimed at admitting each Fall a cohort of 35 students as follows:

- a) Thirty (30) qualified engineers, who graduated from a National university with a five-year duration of study (preferably NTUA) in the last five (5) academic years, with the necessary condition of having a graduation grade of Very Good or higher and a certificate of knowledge of the English language at Proficiency level or IELTS (for study) with a minimum score of 7/10 or a degree from an English-speaking university, and
- b) Five (5) staff members of the Funding Agency (GEK TERNA) who will be university graduates with a license to practice in Greece and will have a certificate of knowledge of the English language at Proficiency level or IELTS (for study) with a minimum grade of 7/10 or a degree from an English-speaking University.

The admission criteria are determined annually. This includes criteria and the details of the application of these criteria, the definition as well as the conduct of examinations or interviews, the results of which are taken into account during the selection process.

Every year a call for expressions of interest to participate in the EDPMS "Management of Infrastructure and Construction Projects" is published. The invitation includes the number of available places, the time period for submitting nomination files, the eligible categories of graduates and the list of necessary supporting documents.

Nomination files are submitted to the Program Secretariat only electronically, according to the instructions given with the announcement. During evaluation the nomination files are taken into account the criteria and conditions of the applicable legislation and draws up a list of candidates' evaluation. The selected MFs are announced on the EDPMS website and updated by the secretariat. Successful applicants must enrol in the program, according to the instructions they will receive from the secretariat, at the beginning of the winter semester of each academic year.

For each MP, a faculty member - among the program's teachers - is appointed as a supervising academic advisor throughout the duration of the studies. The academic advisor does not necessarily also supervise the student's post-graduate thesis.

Course attendance is mandatory, with a maximum of two (2) absences per course. Participation in relevant educational activities such as weekly laboratory-based assignments, projects, short exams, lectures and technical visits is also mandatory. Enrolment in each academic semester is also mandatory.

For the awarding of the Postgraduate Diploma, a passing grade in postgraduate courses and the postgraduate thesis is required. If this is not achieved within two years, the student receives instead a certificate of attendance for the specific courses. The Programme is free of tuition, and it does not allow student mobility, practical training and distance learning.

For graduation the student must successfully complete 90 ECTS: 30 ECTS (5 courses x 6 ECTS per course) during the winter semester, 30 ECTS (5 courses x 6 ECTS per course) during the spring semester, plus 30 ECTS for the Thesis. The Thesis should be written according to the Thesis Guidelines posted on the NTUA’s website. A comprehensive Study Guide is also available electronically.

Analysis of judgement

The review of the proposed PSP found no significant shortcomings in the implementation plan and the approach for the assessment and improvement of the program. Therefore, there is a very high probability for success once the program begins admission and instruction of the first class of graduate students. Since there are no additional sources of funding after the five-year horizon for the PSP or scholarships for the postgraduate students, it would be good to engage additional companies who are interested in hiring graduates of the Programme.

Conclusions

The rules and regulations that have been developed for this Programme guiding admission, progression, recognition and degree award to students are considered adequate. As the plan is for these rules to be reconsidered annually, the EEAP feels that certain adjustments will be necessary, as outlined in the recommendations.

At this point the EEAP finds the Programme fully compliant.

Panel Judgement

Principle 3: Student Admission, Progression, Recognition of Postgraduate Studies, and Degree Award	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

R3.1

- The funding company should not be directly involved in the admission of students to the Programme. The company could nominate future students, but the final decision should rest with NTUA.

R3.2

- The provision to review annually the admission and progression regulations should be treated as an opportunity for the continual Programme improvement, e.g., the relaxation of strict attendance rules for working students.

PRINCIPLE 4: TEACHING STAFF OF NEW POSTGRADUATE STUDY PROGRAMMES

INSTITUTIONS SHOULD ASSURE THEMSELVES OF THE LEVEL OF KNOWLEDGE AND SKILLS OF THEIR TEACHING STAFF, AND APPLY FAIR AND TRANSPARENT PROCESSES FOR THEIR RECRUITMENT, TRAINING, AND FURTHER DEVELOPMENT.

The Institution should attend to the adequacy of the teaching staff of the academic unit teaching at the PSP, the appropriate staff-student ratio, the appropriate staff categories, the appropriate subject areas, the fair and objective recruitment process, the high research performance, the training, and staff development policy (including participation in mobility schemes, conferences, and educational leaves-as mandated by law).

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

Relevant documentation

- Procedures and criteria for teaching staff recruitment and retention, and obligations of the teaching staff.
- List of teaching staff including subject areas, employment relationship, Institution of origin, Department of origin.

Study Programme Compliance

Findings

This new Multidisciplinary Professional Master's Programme spreads among three Engineering Schools, those of Civil, Mechanical, and Electrical and Computer Engineering. The goal of the program is to produce graduates capable of managing large construction and infrastructure projects. However, such an endeavour, in addition to technical skills requires knowledge of economic and legal aspects. Thus, a team of qualified teaching staff were engaged for that purpose.

The teaching staff includes 16 members as follows:

- Seven (7) from the School of Civil Engineering (NTUA)
- Four (4) from the School of Mechanical Engineering (NTUA)
- Two (2) from the School of Electrical and Computer Engineering (NTUA)
- One (1) from the School of Architecture (NTUA)

- One (1) from the School of Chemical Engineering (NTUA), and
- One (1) from Law School (NKUA).

From the above faculty, 11 are full professors, 2 are associate professors, 1 assistant professor, 1 is professor emeritus and 1 practicing engineer. The gender ratio is 15 males to 1 female.

All of the above staff have impressive CVs and have been selected based on rigorous criteria involving field of expertise, experience, recognition documented by academic and professional accomplishments, availability and willingness to participate.

Analysis of judgement

Based on the documents regarding teaching staff qualifications provided by HAHE, it is anticipated that the objectives of the Programme in educating students with respect to infrastructure and construction management projects should be successful.

Conclusions

The selected teaching staff will guarantee the successful implementation of the proposed program. In the future, however, it would be desirable to have a more balanced teaching staff as far as academic rank is concerned (e.g., a better balance between assistant, associate and full professors). Also, to strive for a more inclusive gender balance.

Panel Judgement

Principle 4: Teaching Staff of New Postgraduate Study Programmes	
Fully compliant	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

R4.1 The EEAP recommends that the Programme should achieve a more balanced teaching staff as far as academic rank is concerned (e.g., a better balance between assistant, associate and full professors).

R4.2 The EEAP recommends that the Programme should strive for a more inclusive gender balance.

PRINCIPLE 5: LEARNING RESOURCES AND STUDENT SUPPORT

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

Institutions and their academic units must have sufficient resources and means, on a planned and long-term basis, to support learning and academic activity in general, to offer PSP students the best possible level of studies. The above means include facilities such as the necessary general and more specialised libraries and possibilities for access to electronic databases, study rooms, educational and scientific equipment, IT and communication services, support, and counselling services.

When allocating the available resources, the needs of all students must be taken into consideration (e.g., whether they are full-time or part-time students, employed students, students with disabilities), in addition to the shift towards student-centered learning and the adoption of flexible modes of learning and teaching. Support activities and facilities may be organized in various ways, depending on the institutional context. However, the internal quality assurance proves -on the one hand- the quantity and quality of the available facilities and services, and -on the other hand- that students are aware of all available services.

In delivering support services, the role of support and administration staff is crucial and therefore this segment of staff needs to be qualified and have opportunities to develop its competences.

Relevant documentation

- Detailed description of the infrastructure and services made available by the Institution to the academic unit for the PSP, to support learning and academic activity (human resources, infrastructure, services, etc.) and the corresponding firm commitment of the Institution to financially cover these infrastructure-services from state or other resources.
- Administrative support staff of the PSP (job descriptions, qualifications, and responsibilities).
- Informative / promotional material given to students with reference to the available services.
- Tuition utilisation plan (if applicable).

Study Programme Compliance

Findings

The new Programme “Infrastructure and Construction Program Management (ICPM)” at the National Technical University of Athens (NTUA) has been allocated sufficient and of high-quality facilities in an excellent university campus environment. This promises to allow both the selected faculty and admitted students to achieve the Program’s goals and objectives unencumbered by concerns regarding facilities.

The EEAP was virtually guided through several of the facilities which will be made available to the new Program in order to carry out its mission.

The EEAP believes that there is an adequate number of fully equipped lecture classrooms and amphitheatres, computer classrooms and computer equipped student work rooms, a modern library with ready access to electronic databases, as well as teleconferencing and e-Learning facilities. Available IT support also appears to be adequate.

Well-equipped and adequately supported laboratories and workshops, operated by the Schools supporting the new ICPM Program – those of Civil Engineering (CE), Mechanical Engineering (ME), and Electrical and Computer Engineering (ECE) – will be made available to accommodate the needs of the Faculty and Students in the ICPM Program. Among them are the Hardware Infrastructure Laboratory (CE), Construction Machinery and Project Management (CE), Ergonomics (ME), Production Organization (ME), Operational Research & Logistics (ME), Information Systems Management (ECE), and Decision Support and Management Systems (ECE).

There is a variety of support services available to the students. All entering students are assigned an academic advisor and are made aware of an existing formal process for student appeals and complaints, along with general useful information about the University and available facilities and services. The University also offers a student restaurant, several sports areas, a modern Computer Centre, and a multitude of services and technical support. All of the above information plus a lot more can be found on the NTUA and School of Civil Engineering web sites created for the Postgraduate Program. These sites include the ICPM Study Guide with Course Content descriptions, and information for handling student complaints and objections.

Analysis of judgement

The EEAP has determined that a comprehensive plan has been developed by NTUA for providing all the learning resources and student support personnel and services needed for carrying out this new Postgraduate Program. The careful coordination among all NTUA Offices, Schools, and Services needed for successfully administering the new ICPM Program is evident.

Conclusions

The EEAP has concluded that the NTUA has carefully considered and planned for all aspects of University resources and student support needed for the execution of the strategic plan developed for the new ICPM Program. Therefore, the EEAP finds that the NTUA is in Full Compliance with this Principle.

Panel Judgement

Principle 5: Learning Resources and Student Support	
Fully compliant	X
Substantially compliant	
Partially compliant	
Non-compliant	

Panel Recommendations

R5.1 For safety reasons, due to the interdisciplinarity of this Programme, special care needs to be exercised when the student teams work in unfamiliar laboratories, e.g., high voltage equipment, material testing, chemical agents, etc.

PRINCIPLE 6: INITIAL INTERNAL AND EXTERNAL EVALUATION AND MONITORING OF NEW POSTGRADUATE STUDY PROGRAMMES

INSTITUTIONS AND ACADEMIC UNITS SHOULD HAVE AN INTERNAL QUALITY ASSURANCE SYSTEM, IN WHICH THEY WILL INSTIGATE THE INTERNAL AND EXTERNAL EVALUATION OF THE NEW POSTGRADUATE PROGRAMMES, SO AS TO ENSURE COMPLIANCE WITH THE QUALITY REQUIREMENTS OF THE PRESENT STANDARD. IN THE CONTEXT OF THE ABOVE ACTIONS IT IS NECESSARY TO INFORM ALL INTERESTED PARTIES.

The internal evaluation of the new PSP includes the evaluation of the certification proposal as well as the documentation material in accordance with the requirements of this Standard and the quality procedures of the Institution's Internal Quality Assurance System.

The internal evaluation of new postgraduate degree programmes also aims to ensure the quality level of educational services and to create a supportive and effective learning environment for students.

The Institution, through its Quality Assurance Unit, and the corresponding academic units organizes and supports the external evaluation procedures of the new PSP according to the specific instructions and directions of the HAHE.

The above includes:

- The objectives, content, and structure of the curriculum, the knowledge offered and the level of science and technology in the subject, to ensure the modern nature of the PSP, in accordance with the relevant documentation listed in the decisions of the competent bodies.
- The evaluation of the workload for the development and completion of postgraduate studies.
- The satisfaction of student expectations and needs from their study programme.
- The learning environment, support services, and their appropriateness for the mentioned PSP.

Postgraduate study programmes are designed and established in accordance with the provisions of the Institution's internal regulations and with the participation of students and other interested parties.

Relevant documentation

- The Quality Assurance Unit (QAU) procedure for checking the requirements of the Standard for the quality of new PSP as well as a procedure for organizing and supporting their external evaluation procedures.
- Assessment and feedback mechanisms of the PSP quality strategy and targeting and relevant decision-making processes (students, external bodies).

Study Programme Compliance

Findings

As the ICPM “Infrastructure and Construction Project Management” Postgraduate Program at NTUA is a new program with the expectation that the first admitted students will begin their studies at the start of the Winter 2023 Semester no Internal Certification Review has been conducted, and the present External Certification Review is the first conducted.

As described in detail in Document A1.6. pp.13-14 provided to the EEAP, NTUA, through MODIP, and the School of Civil Engineering, which is the principal School for this new program, are organizing and support the external evaluation procedures in accordance with HAHE’s guidance.

Their plan provides for *“continuous and systematic internal evaluation process with questionnaires, which have already been approved by the NTUA Senate (2012) and in which teachers and students answer from the 11th week of teaching until the end of each semester’s courses.”*

The questionnaires are to be completed electronically and anonymously, and deal with the quality and means of research and teaching, the structure and content of studies, as well as with the available administrative and logistical support.

The results are to be communicated to the respective teachers after issuing grades for each course. Moreover, the results are shared with the members of the EPS and with the Director.

There is an additional evaluation which is provided for by the contract between NTUA and the Program Funding Agency. This evaluation is a prerequisite for the payment to the NTUA of each annual instalment.

Specifically, *“This evaluation does not concern the teachers. Main evaluation criteria are the number and quality of nominations, the ratio of admissions and graduates, the quality of the knowledge offered, the relevance of acquired skills with the needs of the infrastructure sector and constructions, the scientific level of MDEs, the interest and effort of postgraduate students to acquire the offered knowledge, as well as evaluation of the (ICPM Program) by the Postgraduate Students. In order to carry out the above assessment, the students answer a relevant question questionnaire before the end of the courses of each semester.”*

This second evaluation is carried out by a three-member Committee: one member appointed by the Rector of NTUA, a second by HCIC, and a third nominated by the Funding Agency.

Clearly, this contractual arrangement between the NTUA and the Program Funding Agency raises a number of serious concerns about the near-term viability of this new Program, its survivability beyond the first five years, and meeting its responsibilities to the entering and graduating students. The EEAP has not been made aware of a back-up funding plan for this program for: (1) Continuation of the Program through its planned five-year operation should the Funding Agency decide to terminate the annual instalments prior to the proposed 5-year funding period, and (2) For its continuation beyond the end of said period.

Analysis of judgement

Since this is the first external evaluation of this new Postgraduate program, there is no track record of whether prior recommendations were considered or whether any of them were followed. All discussions the EEAP had with the faculty and members of the NTUA Administration, including the Rector and Vice Rector, indicated that they all (1) appreciate and value the importance of such external reviews, (2) would be receptive to recommendations for possible improvements, and (3) plan to give such recommendations serious consideration and would consider adopting those that are feasible.

Conclusions

The EAAP was favourably impressed with the openness and enthusiasm displayed by everyone associated with this new Programme who met during these virtual meetings. As a result, the EEAP members expect that the findings and recommendations resulting from this, and future External Evaluations will be given due consideration.

Therefore, currently, the EAAP finds that this new Program is substantially compliant with Principle 6.

Panel Judgement

Principle 6: Initial Internal and External Evaluation and Monitoring of New Postgraduate Study Programmes	
Fully compliant	
Substantially compliant	X
Partially compliant	
Non-compliant	

Panel Recommendations

R6.1 As soon as possible, NTUA must identify and secure sufficient resources so that this new Program (a) can continue as planned should the Funding Agency decide to discontinue funding it, and (b) to ensure its existence beyond the planned 5-year period.

R6.2 Since this new Programme appears to be extremely important to the Infrastructure and Construction industry, its launch creates a unique opportunity for NTUA to secure the active participation of several companies and public agencies in this arena. These entities can contribute in a variety of ways to help this Programme broaden its reach and enhance its quality, as well as secure its longevity beyond the planned 5-year period.

PART C: CONCLUSIONS

I. FEATURES OF GOOD PRACTICE

- Excellent proposed PSP addressing critical needs of the construction industry.
- A solid process has been established to ensure the compliance of the proposed PSP.
- The vision, goals, and objectives are well thought out and articulated.
- The necessary procedures are well articulated.
- The proposed PSP is based on an excellent plan that needs to be followed meticulously.
- The proposed PSP has the potential to become a prototype for other professional PSPs.
- The PSP with NTUA faculty seal of approval, guarantees high social achievement potential.
- Good rules and regulations have been developed for this proposed PSP.
- Well qualified teaching staff to guarantee successful implementation of the proposed PSP.
- NTUA offers good resources and student support for the execution of the strategic plan.

II. AREAS OF WEAKNESS

- The funding company has been given undue authority in the student admission process.
- Only one funding company involvement over a 5-year period.
- Lack of additional companies' involvement imperils the continuity of funding for the initial five - year period and overall longevity of the PSP.
- Not allowing candidates with considerable work experience to enter the PSP.
- Potential difficulty to recruit by October 2023 the number required of appropriate calibre students for the new PSP.
- Lack of labour market data regarding the employment demand of PSP graduates.
- Lack of information regarding current similar international Programmes.
- There are no incentives provided for top students, e.g., scholarships, etc.
- The teaching staff rank distribution is not balanced and there is no obvious mentoring plan.
- The current gender balance does not reflect good international DEI standards.
- No safety plan was provided to protect interdisciplinary students working in unfamiliar laboratories.
- There is no strategic plan to approach other companies and public foundations to obtain additional funding and broaden PSP's reach and enhance quality.

III. RECOMMENDATIONS FOR FOLLOW-UP ACTIONS

- Secure alternate funding sources.
- Recruit additional industrial companies and government agencies who have vested interests in the success and longevity of this Programme.
- Develop a laboratory safety plan to protect students in the PSP who are unfamiliar with the hazards associated with handling and operating lab equipment.
- Establish an Industrial Advisory Board to strengthen the connection with Industry, the potential employers of PSP graduates, thus securing the PSP longevity.
- Limit the involvement of the funding company to an advisory role in the student admission process.
- Create a culture of mentoring and inclusion of junior faculty to the PSP.
- Develop a strategy for adopting the international DEI standards.
- Allow potential candidates with considerable work experience in addition to standard requirements.
- Revisit annually the admission and progression regulations regarding class attendance for working students.
- Continuously strive to modernize the curriculum by incorporating new and emerging practices.

IV. SUMMARY & OVERALL ASSESSMENT

The Principles where full compliance has been achieved are: **2, 3, and 5.**

The Principles where substantial compliance has been achieved are: **1, 4, and 6.**

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

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

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

The members of the External Evaluation & Accreditation Panel

Name and Surname

Signature

- 1. Prof. George A. Aggidis (Chair)**
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- 2. Prof. Emeritus, Nikolaos D. Katopodes**
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- 4. Prof. Emeritus, Panagiotis (Pete) D. Scarlatos**
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- 5. Ms. Despoina G. Boulogiorgou, Doctoral Student**
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