ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
Εθνικόν και Καποδιστριακόν Πανεπιστήμιον Αθηνών
ΙΔΡΥΘΕΝ ΤΟ 1837

Regulations for the Curriculum, the Preparation of Postgraduate Theses, Student Mobility, and Internship of the Postgraduate Programme

"Earth Sciences and Environment"

ATHENS 2025

Περιεχόμενα

The **Curriculum Regulations**, the **Preparation of Postgraduate Theses**, **Student Mobility**, and **Internships Regulations** of the Postgraduate Programme "Earth Sciences and Environment" are an integral part of—and are included in—the Internal Operating Regulations of the Programme.

The Internal Operating Regulations of the Programme are submitted together (Document No. A11).

Below are the detailed provisions governing enrollment and study in the Postgraduate Programme "Earth Sciences and Environment."

The Curriculum Regulations, the Preparation of Postgraduate Theses, Student Mobility, and Internships Regulations of the Postgraduate Programme "Earth Sciences and Environment" of the Department of Geology and Geoenvironment at the National and Kapodistrian University of Athens were approved by the 12th meeting of the Department's General Assembly on 28 March 2025.

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I. CURRICULUM REGULATIONS

ARTICLE 1. CATEGORIES AND NUMBER OF ADMITTED STUDENTS

1.1. Holders of a first-cycle degree from Departments of Geosciences of domestic Higher Education Institutions (HEIs) or equivalent institutions abroad recognized by the Hellenic National Academic Recognition and Information Center (DOATAP) are admitted to the Postgraduate Program "Earth Sciences and Environment." Graduates of Technological Educational Institutes (T.E.I.) with a relevant scientific background are also accepted. Additionally, holders of a first-cycle degree from related or complementary disciplines to the Geosciences from domestic HEIs, or equivalent institutions abroad recognized by DOATAP, may be admitted. Non-exhaustive examples of such graduates include Physicists, Chemists, Oceanographers, Biologists, Geographers, Archaeologists, Surveying Engineers, Civil Engineers, Mining Engineers, Environmental Scientists, Environmental Engineers, and Agronomists.

1.2. The maximum number of students admitted to the Postgraduate Program is set at fifteen (15) per specialization, totaling forty-five (45) overall. Each specialization admits fifteen (15) postgraduate students, a number which may be increased to a maximum of eighteen (18). Admission of more than fifteen (15) postgraduate students per specialization (up to 18) is permitted only if there are unfilled positions in other specializations, and strictly until the total maximum number of forty-five (45) admitted students is reached. This maximum number of admissions has been determined based on the number of the program's teaching staff, the desired student-to-teacher ratio, available infrastructure, teaching facilities, and the employability prospects of graduates in the job market.

1.3. In addition to the above number of admitted students, one (1) member per year from the categories of Special Teaching Staff (E.E.P.), Laboratory Teaching Staff (E.DI.P.), and Special Technical Laboratory Staff (E.T.E.P.) may be admitted, provided that their duties at the Institution are related to the scientific field of the Postgraduate Program.

1.4. Scholarship holders of the State Scholarships Foundation (IKY) and foreign scholarship holders of the Hellenic Republic for the same or a related scientific field as the Postgraduate Program are admitted without entrance examinations.

ARTICLE 2. ADMISSION PROCEDURE

2.1. The selection of postgraduate students (PS) is conducted in accordance with current legislation, the Regulations for Postgraduate and Doctoral Studies of NKUA, and the provisions of this Regulation.

2.1.1. To be eligible, candidates must hold a first degree or a prior Postgraduate Diploma (MSc) awarded with at least a "Good" classification and a grade equal to or higher than six out of ten (6/10).

2.1.2. To be eligible, candidates must demonstrate a working knowledge of the English language (level B2 or higher), certified either by officially certified copies of English language qualifications or equivalent certificates (a high school diploma from a recognized English-speaking school, or a degree from a recognized English-speaking

university). Knowledge of another European or globally used language is considered an additional qualification.

2.1.3. To be eligible, candidates must achieve a score equal to or greater than one third (1/3) of the maximum possible interview score, as specified in the points allocation system outlined in Appendix I of this Regulation.

2.2. Every May, by decision of the Assembly of the Department of Geology and Geoenvironment of NKUA, a call for applications for admission to the Postgraduate Program is published and posted on the Department's and University's website. Applications, accompanied by the required supporting documents, must be submitted to the Program's Secretariat within the deadline specified in the call, which may be extended by decision of the Coordinating Committee (CC). Candidates may submit one application for one specialization only.

2.3. The Assembly of the Department assigns the Coordinating Committee (CC) the responsibility for overseeing the admissions process. The CC appoints a Selection Committee (SC) for each specialization, composed of three faculty members (academic staff) participating in the program's teaching.

2.4. The required supporting documents are:

1. Application form
2. Short curriculum vitae
3. Copy of both sides of the identity card
4. Copy of degree or graduation certificate and transcript of records
5. Copy of postgraduate diploma and transcript of records, if applicable
6. Recognition of foreign academic degrees (if applicable)
7. English language proficiency certificate at a minimum of B2 level
8. Certificates of proficiency in another foreign language, which must be one or more of the following: French, German, Italian, Spanish, Russian, Japanese, and Mandarin Chinese
9. Motivation letter, in which candidates explain their personal and professional goals in relation to the specialization they are applying for
10. Two letters of recommendation
11. Any other supporting material strengthening the application, such as publications in scientific and technical journals, evidence of participation in conferences, seminars, etc., popular science publications, documented experience in geoscience professional fields, or evidence of other professional experience.

2.5. For candidates from foreign institutions who do not submit a certificate of academic recognition from the Hellenic NARIC (DOATAP), the following process applies:

a) The Department Assembly appoints a committee responsible for determining whether a foreign institution or a type of degree from a foreign institution is recognized.
b) To be recognized, the institution awarding the degrees must be listed in the catalogue of foreign institutions maintained and updated by DOATAP.

c) The candidate must submit a certificate of place of studies, issued and sent by the foreign university. If the place of studies, or part of them, is certified as being within Greece, the qualification is not recognized unless the study period within Greece was at a public Higher Education Institution.

4.6. Candidate evaluation and selection is based on the following criteria, always according to the points allocation system specified in Appendix I of the Internal Operating Regulations of the Postgraduate Programme "Earth Sciences and Environment:

a) Grade of the first degree
b) Level of required knowledge in English
c) Knowledge of a second or more foreign languages of international relevance (French, German, Italian, Spanish, Russian, Japanese, or Mandarin Chinese)
d) Additional studies or training (professional seminars, professional/technical studies, and higher undergraduate and postgraduate studies), certified by appropriate diplomas, degrees, and completion certificates
e) Research activity (if any), as documented by publications in scientific journals, conference proceedings, certificates of participation in scientific conferences, and evidence of participation in research projects
f) Professional experience, as certified by employer statements and/or insurance fund certificates. Weight is given to experience in geoscientific professional fields, with emphasis on its relevance to the specialization applied for. Lesser weight is given to experience in other professional fields
g) Performance during a personal interview before the relevant Specialization Selection Committee (SC)
h) Letters of recommendation provided
i) Motivation letter, outlining personal and professional goals in relation to the specialization applied for

The interview and scoring process must be completed within fifteen (15) working days from the application deadline set in each program's official call for applications.

2.7. Based on the total criteria scores, each Admissions Selection Committee (per Specialization) submits its evaluations to the PMS Coordinating Committee (CC), which compiles the final candidate ranking list and submits it to the Department Assembly for approval. Admitted students (per Specialization) are those eligible candidates who rank within the number of available positions (per Specialization) as defined in the PMS announcement. Candidates ranked beyond the available positions are designated as alternates. If, in any Specialization, the number of admitted students is fewer than two (2), that Specialization will not be offered.

2.8. Successful candidates must complete their registration with the PMS Secretariat within seven (7) days from the date of the Department Assembly's decision. In order to enroll, they must have paid the tuition fees, unless they choose to apply for a tuition fee exemption, in which case the provisions of paragraph 4.9 apply. Payment of tuition fees must be documented by submitting the relevant receipts and/or proof of payment. If a successful candidate does not register within the deadline without justification, or fails to pay the tuition fees, they are automatically disqualified.

2.9. Admitted candidates who believe they meet the eligibility criteria and restrictions of Article 86 of Law 4957/2022 must, within an exclusive deadline of seven (7) working days from the date of notification, submit to the PMS Secretariat a registration application requesting exemption from tuition fees, necessarily accompanied by the original supporting documents, as specified in Article 86 of Law 4957/2022 and Article 11 of this Regulation.

2.10. In the event of a candidate's disqualification, the Secretariat proceeds to invite the first alternate candidate, who must register in accordance with the provisions of paragraph 4.8 of this Regulation. In case one or more admitted students do not register, the alternates (if any) will be called to register in the PMS, based on their ranking in the approved evaluation list (Annex I).

2.11. Upon registration, admitted candidates sign a Solemn Declaration stating that they have read and fully accept, without reservation, the present Operating Regulations of the PMS.

2.12. Academic Advisor: Each newly admitted postgraduate student is assigned a Study Advisor (hereinafter Academic Advisor — A.A.), whose duty and responsibility is to provide academic support to the student through monitoring, advisory coordination, and supervision of their study progress. According to a standing decision of the Department Assembly, the role of Academic Advisor for newly admitted students of each Specialization is assigned to the member of the Supervisory Committee responsible for coordinating the academic activities of the respective Specialization the student follows. The designated A.A. supports the newly admitted postgraduate students during their studies in the PMS and until a Master's Dissertation (M.D.) is assigned to them, at which point the responsibility is transferred to the Dissertation Supervisor.

2.12.1. Interaction between Students and Academic Advisors: At the beginning of the academic year, newly admitted postgraduate students are informed of the name and position of their Academic Advisor and a meeting is scheduled for initial acquaintance. This meeting may take place in person or via teleconference and is of an introductory nature, informing students about the Academic Advisor's role and the support they can provide. Subsequent meetings between the Academic Advisor and students may take place at regular intervals if agreed upon by both parties, or at the initiative of either the student or the Academic Advisor, whenever advice, guidance, or support is considered necessary. Academic Advisors hold office hours for student meetings and guidance, which are announced during the initial acquaintance meeting. Communication between Academic Advisors and students is carried out through the usual means (in-person meetings, telephone, or email), and meetings may be individual or in groups, either in person or via teleconference. The content of these discussions is confidential, and students' personal data are protected by the Academic Advisor.

2.12.2. Duties of the Academic Advisor: The Academic Advisor's role is to advise and support students regarding their study program as well as personal issues related to their studies, and to suggest ways to achieve their individual goals. The Academic Advisor advises and makes recommendations, though

these are neither mandatory nor binding. The Academic Advisor helps, supports, and guides students in forming the best possible understanding of their studies, the prospects and options available to them as graduates of the "Earth Sciences and Environment" PMS Specialization, and their potential career advancement and development. The Academic Advisor also supports students in resolving issues that may cause delays in completing their studies (e.g., by collaborating with other faculty members to provide additional educational material, etc.).

ARTICLE 3. DURATION OF STUDIES

3.1. The duration of studies in the postgraduate program (PMS) leading to the award of a Master's Degree (M.D.S.) is set at three (3) academic semesters, including the time allocated for the completion of the master's thesis.

3.2. Part-time study is not possible in the PMS "Earth Sciences and Environment."

3.3. Extension of studies is possible following a justified request by the postgraduate student (P.S.) and approval by the Coordinating Committee (C.C) and the Department Assembly (D.A.). The maximum allowable time to complete the studies is set at four (4) academic semesters.

3.4. Postgraduate students who have not exceeded the maximum duration of studies may request a temporary suspension of studies for serious reasons such as military service, illness, maternity leave, absence abroad, personal, family, professional, or financial reasons. The request must be justified and accompanied by all relevant official documents from competent public authorities or organizations proving the reasons for suspension of studies. Student status is suspended for the duration of the suspension and participation in any educational process is not permitted.

To be granted a suspension of studies, the postgraduate student must submit a justified request to the Department Secretariat, for which the Coordinating Committee gives an opinion to the Department Assembly that makes the final decision. Suspension of studies can be granted for up to two (2) consecutive academic semesters. Semesters of suspension are not counted towards the maximum normal duration of studies.

3.5. After being placed under suspension of studies:

a. The postgraduate student must immediately submit to the Department Secretariat all documents indicating student status, based on which they have been granted privileges deriving from that status. Such documents include the student ID card, public transport discount card (pass), etc.

b. If the student was assigned a Master's Thesis topic before the suspension was granted, they retain rights over the topic.

c. At least two weeks before the end of the suspension, the postgraduate student is obliged to reintegrate into the study program to continue their studies with all rights and obligations of an active student.

d. If a postgraduate student who was granted suspension does not return and resume their duties and obligations to the PMS immediately after the suspension expires, they are definitively removed from the PMS registry. The removal is effected by an official act of the PMS Director and approved by the Department Council.

ARTICLE 4. STUDY PROGRAM

4.1 The postgraduate program (PMS) begins in the winter semester of each academic year.

4.2 To obtain the diploma of the PMS, a total of ninety (90) ECTS credit units are required. All courses are taught weekly and, as appropriate, include lectures, written practical exercises, written review assignments, laboratory exercises, fieldwork exercises, and scientific visits and guided tours to sites and areas of special interest. The primary instruction takes place in person at the facilities of the Department of Geology and Geoenvironment. In special cases described in Article 7 of this Regulation, teaching may be conducted via synchronous distance learning methods or technologies.

4.3 The language of instruction and writing of the master's thesis is Greek or English. Foreign postgraduate students participating in the PMS within the framework of European Programs (e.g., Erasmus+), pan-European collaborations (e.g., CIVIS), bilateral agreements of the National and Kapodistrian University of Athens (NKUA) with partner foreign universities, intergovernmental cooperation programs between Greece and third countries, or United Nations exchange programs, are taught courses in English.

4.4 During their studies, postgraduate students are encouraged to attend or participate in special seminars, literature review discussions, conferences/workshops related to the PMS subject area, as well as lectures and other scientific events organized by the PMS, the Department, NKUA, and third-party scientific organizations.

4.5 The master's thesis is carried out in the 3rd semester of study and is credited with thirty (30) ECTS.

4.6 PMS postgraduate students are provided the opportunity to participate in an internship program abroad, within the framework of Erasmus+, Civis, or other bilateral agreements with foreign institutions. This participation is possible under the following conditions:

a) Students must have successfully completed the M.Sc. at the 3rd semester of their studies, based on the provisions of the PMS regulations,
b) the internship program lasts for an additional semester beyond the regular duration of studies,

c) the internship is conducted according to existing bilateral agreements between the cooperating institutions,
d) interested students must apply within the prescribed deadlines, accompanied by the required documents (e.g., letter of interest, curriculum vitae).

4.7 The primary instruction is conducted in person at the facilities of the Department of Geology and Geoenvironment. In the special cases of Article 7 of this Regulation, teaching may be conducted by means or techniques of synchronous distance learning.

4.8 The indicative program of courses by specialization is structured as follows:

1. SPECIALIZATION: GEOPHYSICS AND SEISMOLOGY

1ST SEMESTER

Mandatory Courses		Hours per week	ECTS
ΓΣ-Υ01	GEOGRAPHIC INFORMATION SYSTEMS FOR GEOENVIRONMENTAL APPLICATIONS	4	6
ΓΣ-Υ02	PROGRAMMING PRINCIPLES AND TECHNIQUES	4	6
ΓΣ-Υ03	ADVANCED GEOPHYSICS	4	6
ΓΣ-Υ04	ADVANCED SEISMOLOGY	4	6
ΓΣ-Υ05	APPLIED GEOPHYSICS IN GEOLOGY	4	6
	Total	**20**	**30**

2ND SEMESTER

Elective Courses (3 to be selected)		Hours per week	ECTS
ΓΣ-Ε06	SEISMOTECTONICS	5	7.5
ΓΣ-Ε07	APPLIED GEOPHYSICS IN NATURAL RESOURCES AND GEO-ENVIRONMENTAL RESEARCH	5	7.5
ΓΣ-Ε08	SATELLITE GEODESY AND REMOTE SENSING TECHNIQUES IN GEOPHYSICS	5	7.5
ΓΣ-Ε09	APPLIED SEISMOLOGY	5	7.5
ΓΣ-Ε10	COMPUTATIONAL METHODS IN GEOPHYSICS & SEISMOLOGY	5	7.5
ΓΣ-Ε11	EARTHQUAKE SOURCE PHYSICS	5	7.5
ΓΣ-Ε12	LITHOSPHERIC FLUIDS - VOLCANIC AND INDUCED SEISMICITY	5	7.5
	Total	**20**	**30**

3rd SEMESTER

Postgraduate Dissertation	30	
Total	**30**	

2. SPECIALIZATION: ENVIRONMENTAL MONITORING & SUSTAINABILITY

1st SEMESTER

Mandatory Courses		Hours per week	ECTS
ΠΠΒ-Υ01	GEOGRAPHIC INFORMATION SYSTEMS FOR GEONVIRONMENTAL APPLICATIONS	4	6
ΠΠΒ-Υ02	METHODS OF APPLIED RESEARCH IN GEOSCIENCES	4	6
ΠΠΒ-Υ03	SAMPLING AND ANALYSIS TECHNIQUES	4	6
ΠΠΒ-Υ04	ENVIRONMENTAL POLLUTION	4	6
ΠΠΒ-Υ05	MINERAL RESOURCES AND SUSTAINABLE DEVELOPMENT	4	6

	Total	**20**	**30**

2nd SEMESTER

Mandatory Courses		Hours per week	ECTS
ΠΠΒ-Υ06	APPLIED GEOPHYSICS IN NATURAL RESOURCES AND GEO-ENVIRONMENTAL RESEARCH	4	6
ΠΠΒ-Υ07	MULTITEMPORAL MONITORING OF ENVIRONMENTAL PARAMETERS USING REMOTE SENSING METHODS	4	6
ΠΠΒ-Υ08	BIOGEOCHEMICAL CYCLES AND CLIMATE	4	6
ΠΠΒ-Υ09	SUSTAINABLE REMEDIATION OF CONTAMINATED SOIL AND WATER	4	6
ΠΠΒ-Υ10	GEOMATERIALS AND HUMAN HEALTH	4	6
	Total	**20**	**30**

3rd SEMESTER

Postgraduate Dissertation	30	
Total	**30**	

3. SPECIALIZATION: GEOCONSERVATION AND CLIMATIC VARIABILITY

1st SEMESTER

Mandatory Courses		Hours per week	ECTS
ΓΚΜ-Υ01	GEOGRAPHIC INFORMATION SYSTEMS FOR GEOENVIRONMENTAL APPLICATIONS	4	6
ΓΚΜ-Υ02	METHODS OF APPLIED RESEARCH IN GEOSCIENCES	4	6
ΓΚΜ-Υ03	CLIMATIC VARIABILITY AND CHANGE	4	5
ΓΚΜ-Υ04	BIOSPHERE AND CLIMATIC VARIABILITY	4	6
ΓΚΜ-Υ05	GEODIVERSITY AND GEOCONSERVATION	4	7
	Total	**20**	**30**

2nd SEMESTER

Mandatory Courses		Hours per week	ECTS
ΓΚΜ-Υ06	GEOHAZARDS AND GEOLOGICAL MONUMENTS	4	6
ΓΚΜ-Υ07	SURFACE AND SUBSURFACE LANDFORMS	4	6
ΓΚΜ-Υ08	METHODS OF PALEOCLIMATIC RECONSTRUCTION	4	6
ΓΚΜ-Υ09	GEOTOURISM – URBAN GEOTOURISM - GEOTRAILS	4	7
ΓΚΜ-Υ10	ANTHROPOGENIC ACTIVITY AND HISTORIC LANDSCAPES	4	5
	Total	**20**	**30**

3rdth SEMESTER

Postgraduate Dissertation	30	
Total	**30**	

B. Course Content/Descriptions

1. Specialization: “GEOPHYSICS and SEISMOLOGY”

1st Semester – Compulsory Courses

ΓΣ-Υ01 GEOGRAPHIC INFORMATION SYSTEMS IN GEOENVIRONMENTAL APPLICATIONS

Content: Principles of digital cartography, theoretical background for understanding the operation and development of a GIS, ArcGIS environment, management of geographic and descriptive information, introduction of vector and raster data, development and processing of databases. Projection systems. Data analysis. Thematic cartography, map composition, development, management and processing of raster-grid data — trivariate parameters. Spatial statistical analysis of environmental data. GIS applications in the environment, environmental hazard modeling.

ΓΣ-Υ02 PRINCIPLES AND PROGRAMMING TECHNIQUES

Content: Introduction to Python, basic input/output libraries, control conditions and loops, objects and methods, reading from and writing to files, functions and variable scope (local, global variables), nested functions, variable assignment, understanding list syntax structures, adding new packages and libraries. Monte Carlo simulations. Data analysis and basic descriptive statistics, examples of time series analysis with incomplete data, data visualizations and plotting, visualization of geographic and topological data (GeoJSON, TopoJSON) on open-access interactive maps (OpenStreetMap), application of filters to data, data grouping, record merging, advanced topics in time series processing for geophysical and seismological applications.

ΓΣ-Υ03 ADVANCED GEOPHYSICS

Content: The role and contribution of geophysics as a science and its methodologies in the study of Earth's interior. Structure, composition, and functioning of the Earth's interior. Thermodynamics of the Earth's interior — heat transfer. Dynamic fields (Earth's gravitational and magnetic fields). Geo-electromagnetism, the magnetotelluric method in deep structural investigations. Systems for measuring geophysical fields. Seismic exploration of the Earth's interior. Tomographic imaging of the Earth's interior. 2D and 3D simulations of the physical properties of the Earth's interior. Rheology of continuous media in geodynamics and lithospheric physics. Stress and deformation in solid bodies. Constitutive equations. Elasticity and lithospheric flexure. Fluids in the lithosphere. Laboratory simulation of flows in complex geological structures. Continuum mechanics and Earth rheology.

ΓΣ-Υ04 ADVANCED SEISMOLOGY

Content: Theory of elastic waves; stress-strain relationship; equation of motion; seismic wave propagation; wave attenuation and dispersion. Basic principles of designing seismological networks; recognition and classification of seismic phases; epicenter location techniques; introduction to the concept of generalized inversion. Determination of Earth's structure from seismological data; ray tracing; correlation of seismic structure with chemical composition, geological structure, and tectonic setting. Types and uses of earthquake catalogs. Catalog completeness. Spectral analysis: design, construction, and application of filters; calculation of seismic moment. Seismic source function; rupture mechanisms. Seismic hazard, seismic risk, vulnerability, and exposure value. Basic methods for seismic hazard assessment: extreme value theory, semi-statistical method. Application of R-CRISIS software for probabilistic seismic hazard assessment using the semi-statistical method. Accelerogram analysis: peak and spectral ground motion parameters; site response to strong seismic motion; influence of local conditions; microzonation studies. Earthquake early warning: basic principles, methods, and operational systems for early warning.

ΓΣ-Υ05 APPLIED GEOPHYSICS IN GEOLOGY

Content: The role and applications of Geophysics in geology and the geoenvironment. Overview of modern geophysical survey methods and techniques (gravity, geomagnetic, seismic, geoelectrical, electromagnetic, remote sensing, and borehole logging) in applied geosciences, and the capacity of geophysical surveys to contribute to the investigation and characterization of subsurface structures and their physical properties. Correlation of geological formations/lithologies with their physical parameters. Differentiation of measured physical parameters in evaluating results. Selection of geophysical methods/techniques, formulating their principles and limitations, with emphasis on addressing the geological problem. Combined and comparative application of methods based on the investigation target, its physical parameters, and the geological context of application.

Field acquisition of geophysical measurements in real-time (field exercise). Introduction to and familiarization with the required instrumentation and specialized scientific equipment. Analysis of the process for acquiring high-quality field data (conditions and limitations), professional practices, safety measures, and troubleshooting.

Processing, interpretation, and evaluation of 1D, 2D, and 3D geophysical data. Presentation of geophysical results through integrated geophysical-geological cross-sections, maps, and 3D representations. Familiarization with specialized software through applied exercises in applied geophysics and geology. Preparation of scientific theses and technical reports.

2nd Semester

Elective Courses – Choose 4

ΓΣ-Ε06 SEISMOTECTONICS

Content: Seismic faults, active tectonics, deformation, historical and instrumental seismicity, seismic parameters, seismotectonic maps. Methods for determining the hypocenter: graphical methods, focal mechanism determination via first-motion polarity, back-projection methods, the direct and inverse problem of determining focal parameters, error estimation and minimization. Hypocenter relocation methods. Methodologies for determining earthquake generation mechanisms. Spatial distribution of seismic sequences, correlation with active tectonic structures, determination of the geometry of seismogenic structures, temporal variations in seismicity, Gutenberg-Richter law, spatiotemporal variation of the b-value. Stress tensor, methods for determining the tectonic stress field through inversion of focal mechanisms. Coulomb criterion, Coulomb stress changes, correlation with the spatiotemporal distribution of earthquakes.

ΓΣ-Ε07 APPLIED GEOPHYSICS IN NATURAL RESOURCES AND GEOENVIRONMENTAL EXPLORATION

Content: Study of the physical properties and parameters of geological materials and their correlation with subsurface exploration, the detection of natural resources, and the investigation of geoenvironmental issues. Use of geophysical methods and techniques in geoenvironmental surveys. Familiarization with the suitability and selection of geophysical surveys (categorization). Acquisition, processing (qualitative and quantitative), and evaluation of terrestrial and airborne geophysical data. References to applications and case studies from Greece and internationally, including investigations for the detection of

ore deposits, hydrocarbons, and geothermal fields, aquifers, soil pollution, buried targets (archaeology, etc.), and the study and management of natural hazards and disasters.

ΓΣ-E08 SATELLITE GEODETIC TECHNIQUES AND REMOTE SENSING IN GEOPHYSICS

Content: Principles of satellite geodesy using the Global Navigation Satellite System (GNSS); GNSS system architecture, measurement procedures and methods. GNSS data analysis, processing, and solution techniques; mathematical models for position determination. Geodetic reference systems and coordinate/projection system transformations. Strain tensor and its applications in Geophysics and Seismology. Principles of radar interferometry, electromagnetic radiation and its physical concepts. Satellite synthetic aperture radar (SAR) systems: geometric and technical characteristics, image processing techniques for altimetry and ground displacement measurements using radar signal phase. Use, processing, and interpretation of satellite imagery in Geophysics. Optical images: processing and photointerpretation for structure identification using artificial intelligence and machine learning techniques. Thermal images: physical concepts, absolute calibration techniques, and processing algorithms for satellite thermal data. Applications and examples of Geographic Information Systems (GIS) for the processing and presentation of satellite data.

ΓΣ-E09 APPLIED SEISMOLOGY

Content: Introduction to modern tools for sharing and collecting seismological data; contemporary methods for studying microseismicity; applications of seismology in studying Earth's structure and detecting nuclear tests. Acquisition and real-time processing of seismological data. Methods for automatic analysis of seismic data: STA/LTA method, statistical measures of kurtosis and skewness, Akaike Information Criterion (AIC) in autoregressive (AR) models, cross-correlation function and repeating earthquakes, waveform template matching method, machine learning applications for seismic signal detection and focal parameter determination. Waveform inversion method for calculating the seismic moment tensor. Passive seismic travel-time tomography: parameterization of tomographic inversion, synthetic tests, reliability assessment, construction of 3D velocity models. Rayleigh and Love surface waves, dispersion curves, surface wave tomography. Ambient seismic noise tomography. Interpretation of tomographic models at various scales. Temporal variation in seismic wave propagation velocities. Receiver function method. Seismic arrays: fundamental principles and applications. Seismic anisotropy: basic principles and methods, temporal changes in S-wave splitting parameters, applications of seismic anisotropy in forecasting seismic/volcanic events and in hydrocarbon exploration and exploitation.

ΓΣ-E10 COMPUTATIONAL METHODS IN GEOPHYSICS AND SEISMOLOGY

Content: Fundamental knowledge of geophysical and seismological data analysis. Fourier analysis and applications. Linear filters, wavelet transform and applications. Matrices and tensors, eigenvalues/eigenvectors, solving linear systems and their applications. Modeling and simulation of physical processes: least squares method, robust modeling. Forward and inverse problems, nonlinear and linear/linearized inverse problems. Introduction to differential equations, diffusion and wave propagation, numerical solutions (finite differences and finite elements). Applications in geophysics and seismology—seismic wave propagation.

ΓΣ-E11 PHYSICS OF THE SEISMIC SOURCE

Content: Brittle rock fracturing (Griffith theory, experimental studies on rock strength, the influence of pore fluids on fracturing, brittle-ductile transition). Rock friction (theoretical concepts, experimental studies of friction, seismic slip, friction under geological conditions). Laboratory study of deformation—Acoustic Emission (AE) technique—analogous applications to seismicity. Precursory phenomena of rock fracturing in laboratory settings. Mechanics (kinematics and dynamics) of seismic rupture (mechanical framework, formation and propagation of faults, fault strength and rheology, geometric complexity of seismic rupture, and mechanical effects of heterogeneity). Earthquake mechanics (historical development, theoretical foundation, quantitative assessment, mechanics of complex earthquakes).

The seismic cycle and earthquake prediction. Stages of the seismic cycle and their characteristics, interpretation, and models of accumulated inelastic strain. Applications of fractal geometry and self-organized criticality (SOC) models, critical point theory, long-, medium-, and short-term earthquake prediction: models and their interpretation. Physics of the seismic source and applications to early warning systems and the evolution of seismic swarms.

ΓΣ-E12 LITHOSPHERIC FLUIDS – VOLCANIC AND INDUCED SEISMICITY

Content: Elasticity, earthquakes, and microseismic monitoring. Linear elasticity and seismic waves. Fundamental principles of poroelasticity. Linear stress-strain relationships in poroelastic media. Deformation in microcracks and fluid-saturated fractures. Fluid flow and dynamic poroelasticity. Non-linear effects of poroelastic deformation. Stress dependence on elastic properties, non-linear nature of the Biot-Willis coefficient. Degree of poroelastic stress coupling, effective stress coefficients, stress dependence on medium permeability.

Fluids and induced seismicity. Seismicity and linear diffusion of pore pressure. Seismicity during fluid injection. Triggered seismicity fronts. Seismicity fronts and poroelastic coupling. Seismicity in heterogeneous media. Seismicity in the vicinity of large dams. Seismicity during fluid injection.

Fluids and volcanic seismicity. Spatiotemporal patterns of seismicity in volcanic environments. Spectral analysis of seismic signals from tectonic and volcanic settings. Classification of volcanic seismic signals based on waveforms and frequency content. Differences between open and closed volcanic systems. Stress field changes in volcanic environments. Seismic source mechanisms in volcanic areas.

Basic principles of seismic tomography. Applications of passive seismic tomography in volcanic environments. Time-varying (4D) seismic tomography in volcanic settings. Early warning systems and their potential integration into operational frameworks.

3rd Semester

Master's Thesis Preparation

2. Specialization: Environmental Monitoring and Sustainability

1st Semester – Compulsory Courses

ΠΠΒ-Y01 GEOGRAPHIC INFORMATION SYSTEMS IN GEOENVIRONMENTAL APPLICATIONS

Content: Principles of digital cartography, theoretical background for understanding the operation and development of a GIS, ArcGIS environment, management of geographic and descriptive information, introduction of vector and raster data, development and processing of databases. Projection systems. Data analysis. Thematic cartography, map composition, development, management and processing of raster-grid data — trivariate parameters. Spatial statistical analysis of environmental data. GIS applications in the environment, environmental hazard modeling.

ΠΠΒ-Υ02 METHODS OF APPLIED RESEARCH IN THE GEOSCIENCES

Content: Time series analysis (homogeneity testing, time series completion, trends, smoothing, periodicities). Organization and presentation of data, measures of central tendency and dispersion. Data transformations, distributions of climatic parameters, analysis of variance. Relationships between two variables, regression analysis, methods of multivariate statistical analysis. Tests of statistical significance. Fourier analysis. Applications using programming languages (R-project/Python). Functions and applications of laboratory instruments. Laboratory techniques for processing and preparing observation samples, microscopy techniques.

ΠΠΒ-Υ03 SAMPLING AND ANALYSIS TECHNIQUES

Content: Methodologies for field sampling of environmental samples, methods of geochemical surveying. Basic principles for the identification and characterization of geochemical anomalies (due to mineralization or pollution). Sampling aimed at determining geochemical background and geochemical mapping. Methods for chemical analysis of total sample mass and spot analysis of solid samples. Operating principles of modern analytical techniques. Quality control methods for environmental measurement results.

ΠΠΒ-Υ04 ENVIRONMENTAL POLLUTION

Content: Physicochemical characteristics of soils, water systems, and the atmosphere. Pollution of soils, waters, and the atmosphere. Processes governing the transport and fate of pollutants. Sources, dispersion, and interactions of chemical elements within the rock–soil–water–atmosphere–biosphere system. Fundamentals of urban geochemistry. Use of isotopes in Environmental Geochemistry. Element mobility and bioaccessibility, and laboratory analytical methods for the environmental characterization of samples. Risk assessment methodology. Includes laboratory practice involving chemical analyses of environmental samples.

ΠΠΒ-Υ05 MINERAL RAW MATERIALS AND SUSTAINABLE DEVELOPMENT

Content: Mineral resources: classification, genesis, and exploration of ore deposits. Critical Raw Materials (CRMs) for the European Union. Strategic and critical metals, rare earth elements, and their role in the energy transition. Techno-economic evaluation of mineral raw materials. Environmental, economic, and social aspects of mining activities. Life cycle analysis in the mining sector. Regulatory framework in Greece regarding the sustainable development of the mining industry.

2nd Semester – Compulsory Courses

ΠΠΒ-Υ06 APPLIED GEOPHYSICS IN THE EXPLORATION OF NATURAL RESOURCES AND THE GEOENVIRONMENT

Content: Study of the physical properties and parameters of geological materials and their correlation with subsurface exploration, the detection of natural resources, and the investigation of geoenvironmental issues. Application of geophysical methods and techniques, including electrical resistivity, electromagnetic, gravity, magnetic, and seismic surveys (general principles). Familiarization with the suitability and selection of appropriate geophysical survey techniques (classification). Acquisition, processing (qualitative and quantitative), and evaluation of terrestrial and airborne geophysical data. Case studies and examples from Greece and abroad concerning the exploration of ore deposits, hydrocarbons, and geothermal fields, aquifer identification, soil contamination, buried targets (archaeological, etc.), and the study and management of natural hazards and disasters.

ΠΠΒ-Υ07 LONG-TERM MONITORING OF ENVIRONMENTAL PARAMETERS USING REMOTE SENSING METHODS

Content: Definitions and principles of Remote Sensing. The electromagnetic spectrum. Types of resolution. Preprocessing, correction types, digital image processing techniques, histograms, and image enhancement. Spectral analysis. Properties of spectral bands. Arithmetic operations between bands. Time-series (multitemporal) monitoring. Image retrieval from international repositories and services. Approaches and methods for classification of remote sensing data. Photointerpretation.

ΠΠΒ-Υ08 BIOGEOCHEMICAL CYCLES AND CLIMATE

Content: Biogeochemical cycles of C – N – P – S and their relationship with the global climate. Carbon dioxide, methane, nitrous oxide, and the climate crisis. Natural and anthropogenic pressures on the climate system. The hydrological cycle and climate. Decarbonization. Technologies for carbon capture and underground geological storage of CO_2, storage in oceans. Conversion of CO_2 into carbonate minerals, industrial applications of CO_2. Geochemical modeling of CO_2 storage in geological formations.

ΠΠΒ-Υ09 SUSTAINABLE SOIL AND WATER REMEDIATION

Content: Technologies for the remediation of inorganic non-biodegradable pollutants, key characteristics, performance and suitability, advantages and disadvantages. Geochemical mechanisms involved in stabilization. Geomaterials and their role in the sustainable remediation of soils and waters. The challenge of maintaining remediation effectiveness over time. Adsorption experiments – Case studies on the application of geomaterials as pollution stabilization agents. Includes hands-on laboratory practice applying geomaterials for the environmental remediation of polluted waters.

ΠΠΒ-Υ10 GEOMATERIALS AND HUMAN HEALTH

Content: Interactions between the geological environment and human health. Deficiency and toxicity of chemical compounds and elements. Correlation between environmental conditions and endemic diseases. Harmful and beneficial minerals and rocks in human health; use of minerals in the pharmaceutical industry. Environmental epidemiology and toxicology. Geospatial analysis in epidemiology. Case studies.

3. Specialization: Geoconservation and Climate Variability

1st Semester – Compulsory Courses

ΓΚΜ-Υ01 GEOGRAPHIC INFORMATION SYSTEMS IN GEOENVIRONMENTAL APPLICATIONS

Content: Principles of digital cartography, theoretical background for understanding the operation and development of a GIS, ArcGIS environment, management of geographic and descriptive information, introduction of vector and raster data, development and processing of databases. Projection systems. Data analysis. Thematic cartography, map composition, development, management and processing of raster-grid data — trivariate parameters. Spatial statistical analysis of environmental data. GIS applications in the environment, environmental hazard modeling.

ΓΚΜ -Υ02 METHODS OF APPLIED RESEARCH IN THE GEOSCIENCES

Content: Time series analysis (homogeneity testing, time series completion, trends, smoothing, periodicities). Organization and presentation of data, measures of central tendency and dispersion. Data transformations, distributions of climatic parameters, analysis of variance. Relationships between two variables, regression analysis, methods of multivariate statistical analysis. Tests of statistical significance. Fourier analysis. Applications using programming languages (R-project/Python). Functions and applications of laboratory instruments. Laboratory techniques for processing and preparing observation samples, microscopy techniques.

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ΓΚΜ – Υ03 CLIMATE VARIABILITY AND CHANGE:

Content: Introduction to Climatology: Basic concepts, climate systems and their components. Factors of Climate Variability: Solar radiation, atmospheric circulation, oceans, natural and anthropogenic processes. Climate Cycles and Phenomena: El Niño, oceanic oscillations, long-term and short-term climatic changes. Climate Change: Causes (natural and anthropogenic), current trends and scientific projections. Impacts of Climate Change: Extreme weather events, temperature rise, sea level changes, and consequences for ecosystems and human society. Adaptation and Mitigation Strategies: Methods for addressing climate change impacts, analysis of policies and practical examples. Case Studies: Application of theory to real-world examples, data analysis, and impact assessment..

ΓΚΜ – Υ04 BIOSPHERE AND CLIMATE VARIABILITY:

Content: Covers the interactions between the biosphere (ecosystems, biodiversity, living organisms) and climate changes, focusing on the relationships between geological, biological, and climatic processes. Biosphere and Climate Relationship: Interactions, feedback loops, and equilibrium. Natural Processes and Ecosystems under Climate Pressure. Historical Climate Variability and Biosphere Evolution. Biodiversity Management under Climate Variability. Case Studies.

ΓΚΜ – Υ05: GEODIVERSITY AND GEOCONSERVATION:

Content: Geodiversity: Definition and fundamental principles (geological monuments, geosites, geomorphological features). Assessment of Geodiversity: Evaluation criteria, methodologies, and tools. Geodiversity in Greece: Mapping and examples of high-value geosites. Threats to Geodiversity: Human activities and natural factors. Geoconservation: Historical development and principles of geoconservation. Legislation and Governance: National legislation and institutions for the protection of geological heritage; European legislation and the role of international organizations (e.g., UNESCO Global Geoparks). Geoconservation in Practice: Successful case studies. Geoconservation and Society: The role of education in geoconservation. Geoparks: As tools for geoconservation and local development. Community Involvement: Participation of local communities in the preservation and promotion of geosites. Geoconservation Strategies: Methodology for inventory and documentation of geosites. Geosite Classification: Based on scientific, aesthetic, and educational value. Strategy Design for Conservation: Prioritization and action planning..

2nd Semester – Compulsory Courses

ΓΚΜ – Υ06 GEOHAZARDS AND GEOMONUMENTS:

Content: Analysis of the impacts of climate change and geohazards, and their effects on geological monuments. Case studies, sustainable risk management strategies, risk mitigation, and adaptation. Vulnerability models, risk prediction, and risk response methods for the preservation of geological heritage.

ΓΚΜ – Υ07 SURFACE AND SUBSURFACE LANDFORMS:

Content: Geomorphological processes that shape landform development. Evolution of landforms (paleogeographic reconstruction and future projections). The impact of climate change and human activity on landform evolution. Methods and techniques for field study and documentation, including all tools used in the field for data collection and their analysis in the lab.

ΓΚΜ – Υ08 METHODS OF PALEOCLIMATE RECONSTRUCTION

Content: This course explores the fundamental principles and modern techniques used to reconstruct past climatic conditions based on geological evidence. It focuses on the use of paleoclimate proxies such as chemical, biological, and geological indicators, and the study of geological archives including glacial deposits, sediment cores, fossils, and speleothems. Methodological approaches include geochemical analyses, isotope analysis, and micropaleontological techniques. Applications examined involve climate event reconstructions, management of geological data, and studies on interactions between climate and geological processes.

Special emphasis is placed on current trends in paleoclimatology such as the use of artificial intelligence in data analysis and linking paleoclimate records with predictions of climate variability. Students engage in case studies and real data analysis, acquiring skills to interpret climate phenomena and link them to environmental and societal challenges, preparing them for research or professional activity in paleoclimatology.

ΓΚΜ – Υ09 GEOTOURISM – URBAN GEOTOURISM – GEOTRAILS:

Content: **Geotourism:** Basic principles and definition. The role of geological heritage in tourism. Geotourism's contribution to sustainable development. Examples of successful geotourism applications (from Greece and abroad).

Urban Geotourism: Definition and characteristics, geological routes in urban environments. Relationship between geology, culture, and urban development. Selected examples of urban geotourism destinations (e.g., Athens, Berlin). Tools and techniques for showcasing geological features in cities.

Geotouristic Routes: Design and development of routes (e.g., geological trails, fossil forest routes). Use of digital tools and mapping data. Collaborations with local authorities, scientists, and tourism organizations. Examples of thematic routes: geological, ecological, and cultural perspectives.

Sustainable Geotourism: Principles and strategies for sustainable development. Risks of overexploitation of geotourism resources and mitigation approaches.
Visitor Awareness and Education: From educational programs to digital tools.
Geotourism Education and Communication: Development of educational materials and programs for schools and tourists. Raising public awareness about the importance of protecting the geological environment through geotourism.

Case Studies in Geotourism: Examples from Greek and global UNESCO Geoparks and international geotourism destinations: Lessons for the Greek context.

ΓΚΜ – Υ010 ANTHROPOGENIC ACTIVITY AND GEOCULTURAL LANDSCAPES:

Content: Natural and anthropogenic landscapes. Humans as ecological agents: study of the diachronic interaction between humans and/or human communities and the natural environment. Impacts of climate fluctuations on human societies, land-use choices made by past human communities. Environmental history.

3rd Semester

Master's Thesis Preparation

ARTICLE 5. DISTANCE LEARNING

5.1 Synchronous Distance Learning

The organization of the educational process of the Master's Program may also be carried out through synchronous distance learning methods. The organization of courses and other educational activities via synchronous distance learning applies to courses and activities that, by their nature, can be supported through distance learning methods and do not involve practical or laboratory exercises that require the physical presence of students.
The educational process may be conducted via synchronous distance learning methods exclusively under the following circumstances:

1. Force majeure or emergency situations, in which the in-person delivery of educational activities or the use of NKUA's facilities for educational, research, or other activities is not feasible.
2. Organization of in-depth courses and tutorial sessions beyond the mandatory teaching hours per course.
3. The NKUA Digital Governance Unit is responsible for supporting the distance learning process and for matters related to the protection of personal data.

5.2 Asynchronous Distance Learning

The educational process may be carried out using asynchronous distance learning methods, which may not exceed twenty-five percent (25%) of the total ECTS credits of the Master's Program. NKUA maintains an electronic platform accessible to persons with disabilities, through which asynchronous distance learning services are provided. Educational material may be uploaded to the platform per course and may include lecture notes, presentations, exercises, sample solutions, as well as recorded lectures, provided the applicable legislation on the protection of personal data is observed. All types of educational material are provided exclusively for students' educational use and are protected under Law 2121/1993 (Official Gazette A' 25), provided the relevant conditions are met.

ARTICLE 6. EXAMINATIONS AND ASSESSMENT OF POSTGRADUATE STUDENTS

6.1 The academic instruction of each academic year is structured into two semesters: the winter and the spring semester. Each semester includes at least thirteen (13) weeks of teaching and three (3) weeks of examinations. Courses from both semesters may be re-examined during the September examination period.

6.2 In the event a course cannot take place as scheduled, a make-up session is arranged. The date and time of the make-up session shall be posted on the Master's Program website.

6.3 Attendance of courses, laboratory sessions, etc., is mandatory. A postgraduate student is considered to have attended a course (and is therefore eligible to take the exam) only if they have attended at least 80% of the scheduled teaching hours. Otherwise, the student must retake the course in the next academic year. If a student's absences exceed 20% across all courses, the matter of their potential dismissal is referred to the Coordinating Committee, which issues a recommendation to the Assembly of the School/Department.

6.4 The assessment of postgraduate students and their performance in the courses of the Master's Program is conducted at the end of each semester through written or oral examinations, or through written assignments and their presentation. Alternatively, evaluation may be based on assignments carried out throughout the semester; the weight of such assignments in the final grade is determined by the instructor and is specified in the Program's Study Guide. The assessment method is defined by the course instructor. Grades are assigned on a ten-point scale, with ten (10) being the highest grade and six (6) the minimum passing grade. Examination results are announced by the instructor and submitted to the Secretariat of the Program and the Department no later than four (4) weeks after the examination. In case an instructor repeatedly exceeds this deadline, the Director of the Program informs the Assembly of the School/Department.

6.5 The percentage contribution of laboratory exercises, assignments, and seminars to the final grade of each course is determined individually for each course, based on a proposal

by the respective instructor and is stated in the Program's Study Guide.

6.6 In cases of emergencies or force majeure, alternative assessment methods may be applied, such as remote written or oral examinations using certified synchronous and/or asynchronous e-learning software provided by NKUA, ensuring the integrity of the assessment process.

6.7 Alternative assessment methods may be applied for postgraduate students with disabilities and special educational needs, following a decision of the Coordinating Committee and a recommendation by the Department's Disability Committee, taking into account the guidelines of the Accessibility Unit for Students with Disabilities.

6.8 The assessment of students enrolled in second-cycle programs conducted via distance learning may be carried out through remote examinations, provided that the integrity of the assessment process is ensured**.**

6.9 In cases of illness or recovery from a serious illness, it is recommended that the instructor accommodate the student in any way deemed appropriate (e.g., oral remote examination). During oral examinations, the instructor must ensure they are not alone with the student.

6.10 Grade correction is permitted if the instructor identifies errors in the grade entry. Correction is carried out following a written request by the instructor, recommendation by the Coordinating Committee, and decision by the School Assembly.

6.11 If a student fails the same course more than three (3) times, the procedure provided by the applicable legislation is followed.

6.12 Written exam scripts must be securely stored by the course instructor for two (2) years. After this period, the scripts are no longer valid, and a report is drawn up by the Assembly to document their destruction—unless legal, disciplinary, or administrative procedures are pending.

6.13 For calculating the final degree grade, the weight of each course in the curriculum is considered, which is expressed in ECTS credits. The number of ECTS credits of a course constitutes its weighting factor. The degree grade is calculated by multiplying the grade of each course by its ECTS credits, summing the results, and dividing by the total number of ECTS credits required for the degree. The calculation is expressed by the following mathematical formula:

$$Final\ Degree\ Grade = \frac{\sum_{k=1}^{N} Course\ Grade \times Course\ ECTS}{\sum Total\ ECTS\ Required\ for\ the\ Degree}$$

where:

N = number of courses required to obtain the corresponding degree/title

To obtain the postgraduate diploma (D.M.S.), each postgraduate student is required to attend and successfully pass all the compulsory courses of the Postgraduate Program (P.M.S.) and to complete a postgraduate thesis, thus accumulating ninety (90) ECTS credits.

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ARTICLE 7. OBLIGATIONS AND RIGHTS OF POSTGRADUATE STUDENTS

5.1 Postgraduate students have all the rights and benefits granted to undergraduate students, up to the end of any granted extension period, except for the right to free teaching textbooks.

5.2 The Institution ensures accessibility for students with disabilities and/or special educational needs to the recommended textbooks and teaching (https://access.uoa.gr/).

5.3 The Career Office of the National and Kapodistrian University of Athens (NKUA) provides counseling support to students on study and career matters (https://www.career.uoa.gr/ypiresies/).

5.4 Postgraduate students are encouraged to participate in and attend seminars of research groups, literature review discussions, laboratory visits, conferences/workshops related to the subject matter of the postgraduate program, lectures, or other scientific events organized by the program, etc.

5.5 The Assembly of the Department of Geology and Geoenvironment, following the recommendation of the Coordinating Committee (CC), may decide to dismiss postgraduate students if they:

- exceed the maximum allowed absences,
- fail exams in one or more courses and have not successfully completed the program according to the current regulation,
- exceed the maximum duration of study in the postgraduate program as defined by this regulation,
- violate the applicable disciplinary regulations as handled by the competent disciplinary bodies,
- fail to pay the prescribed tuition fees,
- submit a withdrawal request themselves.

5.6 If a postgraduate student is dismissed from the postgraduate program, they may request a certificate for the courses they have successfully passed.

5.7 Students can participate in international student exchange programs such as ERASMUS+ or CIVIS, in accordance with current legislation. In this case, the maximum number of ECTS credits that can be recognized is thirty (30). This opportunity is available after the first semester of study. Students must apply to the Coordinating Committee and comply with the terms of the program.

The postgraduate program can also be attended by students from international exchange programs such as ERASMUS+, according to the relevant agreements.

5.8 Students may undertake internships in collaborating institutions, organizations, enterprises, or research centers abroad that are part of existing bilateral agreements of the program. Internships do not carry ECTS credits. Internships can also be done through exchange programs, e.g., Erasmus+ or Civis, in accordance with current legislation and procedures provided by these programs.

5.9 Postgraduate students of NKUA may enroll in postgraduate programs of the same or other universities in Greece or abroad as part of educational or research cooperation programs, according to applicable law.

5.10 It is possible to study concurrently in an undergraduate program and a postgraduate program or in two (2) postgraduate programs of the same or different departments, of the same or different universities.

5.11 At the end of each semester, an evaluation of every course and every instructor is conducted by the postgraduate students (see article 17).

5.12 Postgraduate students may request the issuance of a diploma supplement in Greek and English.

5.13 To participate in the postgraduate program "Earth Sciences and Environment," postgraduate students pay tuition fees amounting to 800 euros per semester. Payment is due at the beginning of each semester. The obligation to pay fees also applies if the student's studies extend into a fourth semester. The semester fee is paid through the Special Research Account of NKUA, either as a lump sum at the start of the academic semester or in four interest-free equal installments of 200 euros payable during the first ten days of October, December, January, and February of the winter semester, and March, April, May, and June of the spring semester. Tuition fees paid are non-refundable under any circumstances. Students who are in suspension of studies are not required to pay tuition fees for semesters during which they are suspended. Fees already paid are non-refundable.

ARTICLE 8. TUITION FEE EXEMPTION

8.1 Students of postgraduate programs who meet the financial or social criteria and excellence requirements during their first cycle of studies are exempt from tuition fees, according to current legislation. This exemption applies to participation in only one postgraduate program. In any case, exempted students do not exceed thirty percent (30%) of the total number of students admitted to the postgraduate program each academic year**.**

8.2 The application for tuition fee exemption is submitted after the completion of the student selection process for the postgraduate program. The financial status of a candidate in no case constitutes a reason for non-selection in a postgraduate program.

8.3 Those receiving scholarships from other sources or citizens of countries outside the EU are not eligible for exemption.

8.4 The examination of the criteria for exemption from tuition fees is carried out by the Assembly of the School/Department, which issues a reasoned decision accepting or rejecting the application.

8.5 If current legislation sets an age criterion, it is recommended, for reasons of good administration and equal treatment, that the students' date of birth be considered as December 31 of their birth year.

8.6 Members of the categories E.E.P., E.DI.P., E.T.E.P., who are accepted as supernumeraries according to provision 3.4 of this regulation, are exempt from paying tuition fees.

8.7 In the case where members of the same family up to the second degree of kinship by blood or marriage simultaneously attend postgraduate programs at the Institution, there is a possibility to grant a 50% reduction in the tuition fees paid.

ARTICLE 9. EXCELLENCE AWARDS

The postgraduate program (P.M.S.) may award excellence prizes to the top three students of each cohort upon completion of the courses of the 1st and 2nd semesters, following a recommendation by the Coordinating Committee (C.C.) and a decision by the Department Assembly. The awards do not carry any financial benefit. The award certificate is signed by the Director of the P.M.S. and the Chairperson of the Department.

Conditions

1. Average grade of courses in the 1st and 2nd semesters greater than or equal to eight (8).

2. Completion and successful examination during the February exam period (1st semester) and June exam period (2nd semester) within the regular study years (1st and 2nd semester of each cohort).

Procedure

After submission of the June exam grades, the C.C. reviews the grades of the students of the cohort. If the above conditions are met, it ranks the students in descending order (based on their average grade) and proposes to the Department Assembly the $_k$awarding of prizes to the top three (3) students.

Average Grade Calculation:

In all cases of scholarship or award granting, the average grade is calculated by the formula:

$$\boldsymbol{Average\ Grade} = \frac{\sum_{k=1}^{N} \boldsymbol{BM_k} \times \boldsymbol{\Pi M_k}}{\sum_{k=1}^{N} \boldsymbol{\Pi M_k}}$$

where:

N=number of courses in the semester(s) concerned,

BM_k = grade of course k,

ΠM_k = credit units of course k,

$\sum \Pi M$ = total credit units of the semester(s) concerned.

ARTICLE 10. ASSIGNMENT OF TEACHING / TEACHING STAFF IN THE POSTGRADUATE PROGRAMME

10.1 The teaching duties of the Postgraduate Programs (P.M.S.) are assigned, following a recommendation by the Coordinating Committee (C.C.) and a decision by the Assembly of the Department (A.D.), to the following categories of teaching staff:

a) Members of the Teaching and Research Staff (D.E.P.), Special Teaching Staff (E.E.P.), Laboratory Teaching Staff holding a Doctorate (E.DI.P.), and Special Technical Laboratory Staff holding a Doctorate (E.T.E.P.) of the Department, or other Departments of the National and Kapodistrian University of Athens (NKUA), or other Higher Education Institutions (A.E.I.) or Higher Military Educational Institutions (A.S.E.I.), with additional workload beyond their statutory obligations.

b) Emeritus Professors or retired members of the D.E.P. of the Department, other Departments of NKUA, or other Higher Education Institutions.

c) Collaborating Professors.

d) Appointed lecturers.

e) Visiting professors or visiting researchers from Greece or abroad, who hold a position or qualifications equivalent to those of a professor or researcher in a

research center, regardless of their academic rank. Professors of recognized standing from foreign universities may be invited, within the framework of the Erasmus+ Program and/or based on bilateral agreements between the Department and collaborating departments of foreign universities.

f) Researchers and specialized operational scientists from research and technological bodies as defined in Article 13a of Law 4310/2014 (Government Gazette A' 258) or other research centers and institutes in Greece or abroad.

g) Distinguished scientists from Greece or abroad, possessing specialized knowledge and relevant experience in the subject area of the P.M.S.

h) Postdoctoral researchers of the Department.

10.2 All categories of teaching staff may be remunerated exclusively from the resources of the P.M.S. It is not permitted to pay remuneration or any other provision from the state budget or the public investment program. Upon recommendation of the Coordinating Committee and decision of the Assembly of the Department, the amount of remuneration for each teaching staff member is determined. Specifically, teaching staff members who are also members of the D.E.P. may receive additional remuneration for their work in the P.M.S., provided they fulfill the minimum statutory obligations as defined in paragraph 2 of Article 155 of Law 4957/2022. This final provision also applies analogously to members of the E.E.P., E.DI.P., and E.T.E.P., provided they fulfill their minimum legal obligations.

10.3 By decision of the Assembly of the School/Department, supplementary teaching duties may be assigned to PhD candidates of the Department or School, under the supervision of a P.M.S. teaching staff member.

10.4 The assignment of the teaching duties for the P.M.S. is carried out by decision of the Assembly of the Department, following a recommendation from the Coordinating Committee of the P.M.S.

The decisions of the Assembly regarding the allocation of teaching duties must mandatorily include the following details:

a) The full name of the teaching staff member,

b) Their status (e.g. D.E.P. member, E.E.P., E.DI.P., E.T.E.P., lecturer according to P.D. 407/1980, etc.),

c) The type of teaching work assigned per staff member (course, seminar, or laboratory),

d) The number of teaching hours per course, seminar, or laboratory.

10.5 The allocation of teaching work is carried out before the beginning of the academic year for both the winter and spring semesters. In cases where it is not possible to allocate teaching work for both semesters simultaneously, the decision shall be made before the start of each academic semester. With a justified decision of the Assembly of the Department, the assignment of teaching duties may be modified during the academic year.

10.6 Teaching staff, during periods of educational leave or suspension of duties, may provide teaching services to the P.M.S. if they deem it compatible with their schedule, provided that under the prevailing conditions it is essentially and practically feasible — a matter which must be assessed accordingly in each case by the appropriate authority.

10.7 If the teaching staff of paragraph 14.1 are permanent residents of areas outside the administrative boundaries of the Attica Region, they are entitled to reimbursement for travel, accommodation, and subsistence expenses from P.M.S. resources. In every case, they receive a certificate, drawn up and signed by the Director of the P.M.S. and the President of the Department, stating the type and duration of the teaching work they provided.

ARTICLE 11. AWARD OF THE POSTGRADUATE DIPLOMA

11.1 A student completes their studies for the award of a Postgraduate Diploma (P.D.) upon fulfilling the minimum number of courses and credit units required for the acquisition of the P.D., as well as the successful completion of the postgraduate thesis. The Department Assembly verifies the completion of studies to confer the Postgraduate Diploma (P.D.).

11.2 Upon completion of the procedure, the postgraduate student is issued a certificate of completion of studies, their student status is terminated, and their participation in the University's collective governing bodies ceases.

11.3 The Postgraduate Diploma certifies the successful completion of studies and records the final grade, accurate to two decimal places, according to the following scale:

- Excellent (8.50 to 10.00)
- Very Good (6.50 to 8.49)
- Good (5.00 to 6.49)

11.4 The format of the Postgraduate Diploma for each type of Postgraduate Study Programme (P.S.P.) is standardized for all Departments and Schools of the National and Kapodistrian University of Athens (NKUA) and is included in the University's Regulation for Postgraduate and Doctoral Studies.

11.5 Within the framework of the P.S.P., a Postgraduate Diploma is awarded in "Earth Sciences and Environment" with one of the following specializations:

- Geophysics and Seismology
- Environmental Monitoring and Sustainability
- Geoconservation and Climatic Variability.

ARTICLE 12. GRADUATION CEREMONY (OATH-TAKING)

12.1 The graduation ceremony does not constitute a formal requirement for the successful completion of studies; however, it is a necessary prerequisite for the awarding of the official diploma certificate. The oath-taking is conducted within the framework of the Assembly of the Department of Geology and Geoenvironment and takes place at a venue of the Department, in the presence of the Director of the Postgraduate Programme, the Head of the Department, the Dean of the School or their Deputy, and, if possible, a representative of the Rector.

12.2 A request for a graduation ceremony for postgraduate students in the Grand Ceremony Hall of the University's Central Building is examined on a case-by-case basis by the Rector, depending on the circumstances and availability, as well as the number of

graduates, which is communicated by the Secretariat of the Postgraduate Programme to the Directorate of Education and Research.

12.3 Postgraduate students who have successfully completed the Programme, in exceptional cases (studies, residence or employment abroad, health reasons, etc.), may request from the Secretariat of the Department an exemption from the obligation of attending the oath-taking ceremony. This exemption is granted by the Head of the Department and the Vice-Rector for Academic Affairs and Student Welfare.

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APPENDIX I

SCORING SYSTEM FOR EVALUATION AND RANKING OF POSTGRADUATE APPLICANTS

Item	Criterion	Weight (W)	Score Range	Max Points (W × Max Score)
a.	**Undergraduate Degree Grade**	30	0 – 10	**300**
b.	**English Language Proficiency**	8	0 – 10	**80**
	• C2 (Proficiency) – 10			
	• C1 (Advanced) – 8			
	• B2 (Lower) – 5			
	• Diploma from an English-medium institution – 10			
c.	**Other Major European & World Languages**(French, German, Italian, Spanish, Russian, Japanese, Mandarin Chinese)	4	0 – 10	**40**
	• Full proficiency – 10• Functional knowledge – 5			
d.	**Additional Studies & Training**	20	0 – 4.5	**90**
	• Postgraduate programs – 3.5• Undergraduate programs – 3			
	• Relevant internship – 0.25• Continuing education/seminars/short courses – 0.75			
e.	**Research Activity**	20	0 – 4	**80**
	• Publications (journals/conference proceedings): ≥ 3 → 3; 2 → 2; 1 → 1• Participation in research projects → 1			
f.	**Geoscientific Professional Experience**Other Professional Experience	20	0 – 4	**80**
	• ≥ 10 years → 3.5; 5–10 → 3; 2–5 → 2; up to 2 → 1• Other experience (general) → 0.5			
g.	**Interview**	29	0 – 10	**290**
h.	**Motivation Statement**	4	0 – 10	**40**
	Total Available Points			**1 000**

II. "REGULATIONS FOR THE PREPARATION OF THE POSTGRADUATE DIPLOMA THESIS"

1. The assignment of a master's thesis (MSc thesis) takes place after attending all the courses of the study program and successfully passing their examinations. The assignment of an MSc thesis and the appointment of the Supervisor and the Three-Member Examining Committee (T.E.E.) is not permitted if the postgraduate student (PS) has not successfully completed the courses of the 1st and 2nd semesters and still has exams or any other academic obligations or pending issues toward the postgraduate program. The assignment and appointment are also not permitted if the PS has not paid the tuition fees for the 1st and 2nd semesters without having been exempted from fees, and has financial obligations toward the program.

2. The MSc thesis must be individual, original, have a research character, and be written according to the writing guidelines posted on the website of the postgraduate program.

3. The assignment of an MSc thesis topic to a PS is done at the beginning of the 3rd semester through one of the following procedures:

a) Direct negotiation and agreement between the interested PS and the Supervisor. The agreement may be written and includes the provisions of paragraphs 9.6 and 9.7 of this Regulation.

b) Any teaching staff member of the postgraduate program belonging to one of the categories of Article 14, paragraph 14.1 of the Internal Regulation may propose an MSc thesis topic based on ideas and/or data available to them. In this case, following a request by the Supervisor to the Coordinating Committee (C.C), a call for expressions of interest is posted on the announcements section of the postgraduate program's website "Earth Sciences and Environment" as well as on the department's website announcements. The call includes the proposed title and a summary of the scientific subject and methodology of the MSc thesis. Negotiation follows between interested PS and the Supervisor. If an agreement is reached, it may be written and include the provisions of paragraphs 9.6 and 9.7 of the Internal Regulation.

c) Any PS with ideas they consider suitable for MSc thesis level work may submit a request to the CC in which the proposed title and proposed Supervisor are necessarily stated, and a summary of the scientific subject and methodology of the thesis is attached. This is followed by negotiation between the PS and the proposed Supervisor. If an agreement is reached, it may be written and include the provisions of paragraphs 9.6 and 9.7 of the Internal Regulation.

In all cases (a), (b), and (c), once an agreement is reached, the PS submits a request to the CC stating the proposed thesis title, the Supervisor's name, and attaching a summary of the scientific content and methodology of the MSc thesis. The CC evaluates the request and recommends it to the Department Assembly of the postgraduate program, which makes the final decision, appoints the Supervisor, and forms the three-member examining committee for thesis approval, one member of which is the Supervisor. The language of the MSc thesis can be Greek or English and is determined with the topic assignment.

4. The title and/or subject of the MSc thesis may be modified upon request by the PS or the Supervisor, with the consent of the other party. The request must include a brief justification for the change.

5. The intellectual property rights of the MSc thesis are determined according to the intellectual property policy and internal regulations of the National and Kapodistrian University of Athens (NKUA).

6. To approve the thesis, the student must defend it before the three-member examining committee.

7. The Supervisor and members of the three-member examining committee are appointed from the following categories who have undertaken teaching duties in the postgraduate program:
a) Members of Faculty (D.E.P.), Special Teaching Staff (E.E.P.), Laboratory Teaching Staff holding a doctoral degree (E.D.I.P.), and Special Technical Laboratory Staff holding a doctoral degree or other Higher Education Institution (A.E.I.) or Higher Military Educational Institution (A.S.E.I.), with additional employment beyond their legal obligations if the postgraduate program charges tuition fees,

b) Emeritus Professors or retired faculty members of the Department or other Departments of NKUA or other Higher Education Institutions,

c) Collaborating professors,

d) Assigned lecturers,

e) Visiting professors or visiting researchers,

f) Researchers and special functional scientists of research and technological organizations as per article 13A of law 4310/2014 (A' 258) or other research centers and institutes in Greece or abroad,

g) Postdoctoral researchers of the Department.

By decision of the CC, supervision of theses may also be assigned to members of Faculty, Special Teaching Staff, Technical Staff, and Laboratory Teaching Staff of the Department who have not undertaken teaching duties in the postgraduate program**.**

8. Once approved by the examining committee, MSc theses are mandatorily uploaded to the Digital Repository "PERGAMOS," according to decisions of the NKUA Senate. In cases where the thesis contains confidential information, the full text upload to "PERGAMOS" may be postponed for up to three years, upon the request of the Supervisor, co-signed by the PS**.**

9. If the MSc thesis contains original unpublished results, upon request of the Supervisor and co-signed by the PS, only the summaries may be published on the website, with the full text published later**.**

10. The entire process of MSc thesis preparation and examination must not exceed five (5) months from the date of topic assignment. Extensions may be granted only in special cases with the consent of the Supervisor, after a justified request by the PS, recommendation by the CC, and final approval by the Department Assembly. The length of the extension is decided case by case according to the cause. If after the extension period the PS has not

completed the MSc thesis, the case is referred to the CC for possible dismissal due to exceeding the maximum allowed study period.

III. REGULATIONS FOR STUDENT MOBILITY

Article 1 – Purpose

These Regulations define the procedures, terms, and conditions for the participation of postgraduate students in mobility programmes (e.g., Erasmus+, CIVIS, other EU or bilateral agreements) within the framework of the Postgraduate Programme.

Article 2 – Eligible Candidates

Postgraduate students who have successfully completed the first semester of their studies and remain matriculated during the mobility period are eligible to apply.

Article 3 – Types of Mobility

Mobility may include:

Study at a partner institution abroad

Traineeship / internship

Preparation of the master's thesis

Participation in Summer Schools, Blended Intensive Programmes (BIPs), or other short-term mobility formats

Article 4 – Application Procedure

Students submit an application dossier to the Programme Secretariat, including:

- Learning Agreement or equivalent mobility plan
- Letter of acceptance from the host institution
- Brief curriculum vitae

The Coordinating Committee reviews applications, and the Department Assembly grants final approval**.**

Article 5 – Selection Criteria

a) Academic performance

b) Relevance of the mobility programme to the student's field of study

c) Foreign language proficiency

d) Availability of funding and institutional partnerships

Article 6 – Funding

Mobility may be funded by:

a) Erasmus+ grants

b) CIVIS network scholarships

c) Departmental cooperation agreements

d) Student's own resources

Article 7 – Recognition and Academic Credit

Mobility under Erasmus+ or similar programmes (e.g., CIVIS) carries full academic recognition of courses or activities, contingent on prior approval via a signed Learning Agreement (or equivalent).

For a semester-long mobility, the student must earn at least 30 ECTS credits at the host institution. Short-term mobility (e.g., Summer Schools, BIPs) is credited proportionally.

Student performance is documented by:

a) Transcript of Records

b) Activity reports or deliverables (if required)

c) Final evaluation from the host institution

The Department Assembly formally ratifies credit recognition, upon recommendation by the Coordinating Committee, and records it in the student's academic file.

Article 8 – Student Obligations

During mobility, the student must:

- Remain enrolled in the Postgraduate Programme
- Submit all required proof of completed activities upon return

Article 9 – Final Provisions

These Regulations are approved by the Department Assembly and incorporated into the Programme's Internal Operating Rules. Amendments follow the same approval process.

IV. INTERNSHIP REGULATIONS

No internship is provided for the Postgraduate Programme “Earth Sciences and Environment.”