



UNIVERSITÀ
DEGLI STUDI
DI MILANO

Master's degree programme in
Geophysics

facoltà di

SCIENZE E TECNOLOGIE

Applications and admissions

Open, subject to entry requirements.

Admission requirements

The admittance to the MSc in Geophysics requires the possession of curricular requirements relating to the first-level degree, the skills and knowledge acquired in specific scientific-disciplinary sectors, as well as the possession of adequate personal preparation.

To be admitted, the applicant must hold a scientific or engineering degree (Laurea), according to the system governed by DM 270/04 or DM 509/99, or other qualification obtained abroad recognized as suitable based on current legislation, which satisfies the following minimum curricular requirements: at least 60 ECTS in specific scientific-disciplinary sectors specified in Manifesto degli Studi.



Use the QR code to download a syllabus illustrating the knowledge of physics, mathematics and computer science required for admission.

The applicant must also have an adequate knowledge of the English language, comparable with the B2 level of the Common European Framework of Reference for the knowledge of languages (CEFR). If the student holds an official certification, dating back no more than three years before the application, which certifies a knowledge of at least B2 level of the CEFR or if he/she holds a bachelor's degree, or equivalent qualification issued abroad, referring to a study course taught in English, the knowledge of English is automatically acknowledged.

The admission commission is entrusted with the following tasks:

- a. Verification of the minimum curricular requirements, for candidates holding an Italian qualification;
- b. Verification of the correspondence between course units, in terms of credits and educational content, and of the minimum curricular requirements for students holding a qualification issued by a foreign university;
- c. Evaluation of the previous study curriculum of the individual applicant and decision on the need for an in-depth interview;
- d. Evaluation of the students personal preparation and adequate knowledge of the English language, through the interview, when deemed necessary;
- e. Evaluation of the possible recognition of credits for students who have already obtained a MS degree or a first or second level university master's degree, for which it is therefore possible to plan a short study course;
- f. Conclusion of the verification of the adequacy of the student's initial preparation with admission or non-admission; any non-admission must be adequately motivated.

Objectives

The specific objective of the Master degree in Geophysics is to train MSc doctors who have the ability to:

- a) develop and apply mathematical and numerical models of geophysical and environmental systems and processes involving atmosphere, hydrosphere, cryosphere, lithosphere and interior of the Earth;
- b) design and carry out geophysical observation and exploration of the planet Earth at different scales, with particular reference to geophysical surveys applied to the environment, cultural heritage, civil and infrastructural engineering, research and exploitation of natural resources;
- c) analyze and design activities for the mitigation of natural and environmental risks, also aimed at intervention in the prevention and emergency phases, independently or in working groups together with professionals with other specializations.

Career prospects

The role of the graduate in Geophysics in a working context concerns the analysis and solution of geophysical problems *lato sensu*, as well as scientific research and applicative studies on geophysical aspects concerning the Earth system. This function can be carried out both as an employee within the technical roles of public and private entities, even at a high professional and managerial level, and as a freelancer.

The graduate in Geophysics can develop and apply mathematical and numerical models of geophysical and environmental systems and processes, which involve atmosphere, hydrosphere, cryosphere, lithosphere and interior of the Earth, and can plan and carry out geophysical observation and exploration activities of the planet Earth at different scales, with particular reference to geophysical investigations with various application fields.

The final objectives, both in the public and private sectors, include: the production of data, processed from raw data, which can be obtained from the geophysical instrumentation for measuring the different components of the Earth system and at different spatial and temporal scales; the elaboration, through "forward" models, of forecasts of the evolution in time and space of processes concerning different components of the Earth system.

Graduates in Geophysics can also carry out, independently or in working groups, activities for the mitigation of natural and environmental risks, especially in relation to the hazard linked to seismicity, extreme weather events, environmental contamination. In particular, they can share their skills with professionals who have different backgrounds, such as engineers, geologists, computer scientists, in order to optimize and harmonize activities concerning environmental issues, natural risks, protection and management of natural resources, land planning, both in the private and public sectors. This professional figure is particularly useful, as it can also act as a link between companies, public bodies or offices with stakeholders or decision makers. The refinement of transversal skills, such as problem solving, team work, coding, qualifies the graduates in Geophysics also in view of professional opportunities not strictly related to geophysics.

Finally, the skills acquired in the operational and management field, combined with the general preparation on the topics central to the MS degree, can also allow graduates in Geophysics to assume responsibility and coordination functions both in public administration and in the private sector.

Graduates in Geophysics can find various immediate professional opportunities: technical roles in bodies or institutions that explicitly deal with geophysics and/or environmental issues, natural risks, management of natural resources; positions for carrying out research and development or technical-scientific activities in companies operating in the fields of geophysical exploration, environmental protection, meteorology, development of instrumentation and software for geophysical modelling and data mining. Graduates in Geophysics can carry out professional consultancy activities in the same areas and apply to the state exam for "geologist" (Section A of the professional register of the order of geologists, pursuant to DPR 05/06/2001, n. 328), for the passing of which a targeted training course plan will be required, through an appropriate selection of elective activities, also after the degree, e.g., as a trainee in professional offices.

Graduates in Geophysics can also continue their studies in doctoral courses, both in Italy and abroad, to start an international career in the academic field, in research institutions or in geological services, or to pursue a career in high-level technical-scientific roles, also with responsibility for projects, laboratories and structures, in organizations, institutions and companies.

Thanks to the flexible and technological training based on the most advanced data acquisition and software development methodologies, the professionalism of graduates in Geophysics can also be appreciated in fields different from those relating to the components of the Earth system to which the course of study is dedicated, with the possibility of playing a managerial role.

Finally, graduates in Geophysics can access training courses for teaching in Italy in lower secondary school (Scuola secondaria inferiore) in class A-28 (Mathematics and science) and upper secondary school (Scuola secondaria superiore) in classes A-20 (Physics) and A-50 (Natural, chemical and biological sciences). This opportunity is subject to the fact that the student has acquired, during his/her university career, the minimum credits required in appropriate scientific disciplinary sectors (see Table A attached to DPR 14/02/2016, n. 19) and 24 credits in anthropo-psycho-pedagogical disciplines and in teaching methodologies and technologies, specifically related to the class for which he/her intend to apply for access, in accordance with current legislation (D.Lgs. 13/04/2017, n. 59).

Degree syllabus

Undefined course year

COMPULSORY LEARNING ACTIVITIES	ECTS
I semester	
Earth materials: genesis, composition, evolution, properties	6
Geological environments and structures	6
Introduction to continuum physics	6
II semester	
Advanced topics in physics	6

FURTHER ELECTIVE COURSES	ECTS
The student must choose four of these courses, of which at least one for each of the GEO/10 (Geophysics of solid Earth), GEO/11 (Applied geophysics) and GEO/12 (Oceanography and physics of the atmosphere) subject areas	
I semester	
Electrical, electromagnetic and gravimetric methods for environment and exploration	6
Physics of the atmosphere	6
Physics of the hydrosphere and the cryosphere	6
Seismology and laboratory	6
II semester	
Seismic and wave field exploration	6
Solid Earth geophysics	6

FURTHER ELECTIVE COURSES	ECTS
<p>The student must choose three courses among the following:</p> <ul style="list-style-type: none"> - Data analytics, forward and inverse modeling: electric and electromagnetic methods in applied geophysics (<i>not activated a.a. 2026/2027</i>) - Geodetic data modelling and inversion (<i>not activated a.a. 2026/2027</i>) - Environmental governance - Fisica dell'ambiente - Geostatistical methods for geophysics - International, European and comparative environmental law - Data analytics, forward and inverse modeling: geophysical and environmental fluid dynamics - Metodi per l'elaborazione, analisi e rappresentazione di dati geofisici - Numerical modelling of geodynamic processes - Tectonophysics - The basics of probability theory and statistics 	6 + 6 + 6
<p>The students must choose two courses among the following alternatives and other courses offered by the University, including the courses listed above and which have not been selected:</p> <ul style="list-style-type: none"> - Seismic imaging - Field course - Formation of stars and planets - Introduction to dynamic and synoptic meteorology - Spaceborne Earth observation - Well logging 	6 + 6


Elective activities

- 9 ects for Internship. As an alternative, foreign students can earn 6 ECTS with a shorter Internship and 3 ECTS for Additional Language Skills: Italian.
- Final exam (33 ECTS).


INFO

 **Disciplinary classification:** Geophysics (LM-79 R)


 **Duration:** 2 years (120 ects)

 **Attendance:** Attendance at lessons is strongly recommended. Attendance to practical activities and exercises is mandatory; alternative activities will be offered to students who cannot attend for justified reasons.

 **Location:**
Città Studi Campus - Milan

 **For information:**
geophysics@unimi.it

 **Websites:**
geophysics.cdl.unimi.it
www.unimi.it

 **Social media:**
FACEBOOK: MScGeophysics.LaStatale
INSTAGRAM: mscgeophysics.lastatale
LINKEDIN: <https://www.linkedin.com/company/105718250>



UNIVERSITÀ
DEGLI STUDI
DI MILANO