# UNIVERSITA' DEGLI STUDI DI MILANO
# MANIFESTO DEGLI STUDI A.A. 2025/26
# LAUREA MAGISTRALE IN
# GEOPHYSICS (Classe LM-79)
# Immatricolati dall'a.a. 2022/23 al 2024/2025

## *GENERALITA'*

| | |
|---|---|
| **Classe di laurea di appartenenza:** | LM-79 Classe delle lauree magistrali in Scienze geofisiche |
| **Titolo rilasciato:** | Dottore Magistrale |
| **Durata del corso di studi:** | 2 anni |
| **Crediti richiesti per l'accesso:** | 180 |
| **Cfu da acquisire totali:** | 120 |
| **Annualità attivate:** | 2° |
| **Modalità accesso:** | Libero con valutazione dei requisiti di accesso |
| **Codice corso di studi:** | F8B |

## *RIFERIMENTI*

**Presidente Collegio Didattico**

prof. Mauro Giudici

**Docenti tutor**

Academic guidance tutor - Prof. Gabriele Cambiotti
Erasmus and international mobility tutor – Dott. Luca Mortarini
Internship tutor - Prof. Gianluca Fiandaca
Study plan tutor - Prof. Alessandro Comunian, Prof. Anna Maria Marotta, Prof. Gabriele Cambiotti, Prof. Gianluca Fiandaca
Admission tutor – Prof. Alessandro Comunian, Prof. Gianluca Fiandaca, Prof. Anna Maria Marotta
Disability tutor - Prof. Gabriele Cambiotti

**Sito web del corso di laurea**

https://geophysics.cdl.unimi.it

**Academic Services Office**

Milan - via Botticelli, 23 Email: geophysics@unimi.it

**Enrolment and Admission**

https://www.unimi.it/en/study/enrolment

**Representative for disability services and specific learning disabilities**

prof. Gabriele Cambiotti

**Student Desks - International Students Office**

Milan - Via S. Sofia, 9/1 https://www.unimi.it/en/study/student-services/welcome-desk-informastudenti

**Students Desks - Registrar Office**

Milan - via Celoria 18 https://www.unimi.it/en/study/student-services/welcome-desk-informastudenti

## *CARATTERISTICHE DEL CORSO DI STUDI*

**Obiettivi formativi generali e specifici**

The specific objective of the Laurea magistrale (MS degree) in Geophysics is to train master's 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.

In this context, the MS program aims to provide an in-depth broad-spectrum preparation in geophysics, based on a solid knowledge of physics and geological sciences. This is guaranteed through characterizing activities, which are divided into two exams in the physical disciplines (12 credits), two exams in the geological disciplines (12 credits, with extensive field activity) and four exams in the geophysical disciplines (24 credits), in order to provide a common in-depth knowledge. These activities provide the student with an adequate mastery of the scientific method of investigation, strengthening the knowledge acquired in the first level degree courses. The teaching activities in the physical and geological disciplines play a fundamental role to align the preparation of students. In fact, the MS in Geophysics can be attended by students with a very diversified background: students with a bachelor or first-level academic degree in different courses of the scientific area; students from different universities and from different countries, not only European, but also from other continents. To facilitate the alignment of students' preparation, the more traditional teaching activities in the physical and geological disciplines are accompanied by supplementary tutorial activities, dedicated to sub-groups of students, and almost "personalized".

Akin and integrative activities (3 exams, 18 credits) include exams in the engineering area (geomatics), environmental physics and legal and/or economic/managerial issues. They also include exams of geophysical disciplines, but with a specific focus on the development and use of mathematical models of geophysical processes and methods of geophysical data analysis, also with the use of the most modern techniques of data mining and machine learning. These activities can provide graduates in Geophysics with adequate digital and general skills in STEM disciplines (development and application of data analysis and interpretation techniques), but also with transversal skills very useful for the employability of the graduates and for their ability to adapt to a rapidly evolving world of work.
Through the elective activities (12 credits), the student can acquire more specific skills, in one or more of the following aspects: solid Earth geophysics (dynamics of the lithosphere and the Earth's mantle; seismology); geophysics of the fluid Earth (physics of the atmosphere; transport of contaminants; water circulation in the subsoil and in the seas); applied geophysics (exploration and monitoring of the subsoil, for the characterization of energy, water, mineral resources, cultural and environmental heritage and seismic and hydrogeological risk). Among the elective activities, it is also possible to find course units that are taught, within the framework of specific agreements, by high-quality technical and scientific personnel of institutions and companies outside the university environment and who provide more operational training in the professional field.
All course units include laboratory or field exercises, to complement "theoretical" training with practical activities, especially for the physical-mathematical modelling of phenomena and the geophysical processing and interpretation of data, also through the development of dedicated software. These activities provide the student with advanced operational skills both in laboratory work and in the collection of geophysical data in the field and in physical-mathematical modelling and its applications. These activities are also aimed at encouraging the acquisition of transversal skills, such as critical and innovative thinking, presentation and communication skills, organizational and teamwork skills, self-discipline.
The student completes his/her preparation by carrying out an internship (internal, i.e. at the University laboratories, or external, at external bodies), also aimed at improving transversal skills, and with the preparation of a MS thesis that will commit the student to work for at least one semester on an argument of basic or applied research.
The student can carry out part of the teaching activities, including the MS thesis, at foreign universities and research centers, as part of the international mobility programs for students and teachers.

**Risultati di apprendimento attesi**

Knowledge and understanding
Graduates in Geophysics have a high level of knowledge and critical understanding of the various aspects of geophysics and a solid methodological basis for the study and analysis of geophysical processes, which involve, often with complex interactions, the different compartments of the Earth. They have the basic knowledge of geosciences and the physical, mathematical and computer skills to deal with the development and application of data acquisition and processing methodologies and numerical simulation models. Therefore, graduates in Geophysics acquire an ability to update their knowledge and skills, in such a way as to face their professional activity, in any sector and in any role, always keeping in mind the leading-edge of international scientific research and exploiting the most advanced methodologies and technologies to address the problems posed by the interaction of the planet Earth with the development of the human species and society.
More specifically, through the choice of an appropriate study plan, the student can acquire advanced knowledge in one or more of the following fields:
1) Geophysics of the solid Earth and seismology (dynamics of the lithosphere and the Earth's mantle, earthquakes);
2) Geophysics of the fluid Earth (physics of the atmosphere; meteorology; climatology; physics of the continental and marine hydrosphere; physics of the cryosphere);
3) Applied geophysics (planning and execution of geophysical campaigns; data processing; forward modelling; inversion and interpretation).
The knowledge and understanding skills indicated above are achieved through participation in lessons, exercises, individual study, in accordance with the individual study plans.
The assessment of knowledge and understanding takes place through written and/or oral exams.

Ability to apply knowledge and understanding
Graduates in Geophysics are able to apply the acquired knowledge in different directions.
From the point of view of investigation and analysis techniques, they are able to:

1) Design, build and manage monitoring stations and networks;
2) Design and implement experimental measurement campaigns and Earth exploration;
3) Manage and process large sets of data, through mathematical and computer techniques specifically developed for geosciences;
4) Develop and apply numerical simulation models with different purposes:
a. The advancement of knowledge on the physical mechanisms that regulate the "functioning" and evolution of the planet Earth;
b. The interpretation of observational and experimental data, even with the solution of inverse problems;
c. The prediction of the future evolution of the planet Earth, at different spatial and temporal scales, also with the ultimate goal of contributing to the sustainable management of natural resources and the mitigation of natural and anthropogenic risks.
From the point of view of possible applications, graduates in Geophysics are able to provide a contribution of high scientific and technical quality in various sectors, concerning, for example:
1) Natural resources (water, energy, minerals, ...);
2) Natural hazards (seismic, hydro-meteorological, subsidence, ...);
3) The quality of the environment (air, water and soil);
4) The effects of climate change on human activities, natural resources and natural and man-made risks.
The skills to apply knowledge and understanding indicated above are achieved through participation in the course units, in particular with (a) exercises, also with activities in experimental or computational laboratories and in the field, (b) autonomous activities of the students, and (c) during the internship and preparation of the MS thesis.
The assessment of the acquisition of these skills takes place through oral and/or written exams, in which the student must demonstrate the mastery of tools and methodologies and their applications. For many course units, the exams provide even more specific methods of evaluating this ability, e.g., through the drafting of written reports, or other forms of communication, including multimedia, referring to projects carried out by students, even with a certain degree of autonomy.
An overall assessment of the ability to apply what has been learned in the various course units takes place with the preparation and drafting of the MS thesis, related to an original research activity aimed at solving a theoretical or experimental physical problem and carried out with a personal autonomous contribution, within a research team.

Making judgements
During the MS course, students are guided in every training activity to acquire a strong autonomy of judgment, which makes them capable of:
1) Analyzing a problem (both theoretical and applicative), also through bibliographic research to examine the progress of scientific research and available technologies;
2) Focusing the key points to tackle the solution of a technical-scientific problem, in the light of the most advanced knowledge, methodologies and technologies;
3) Planning an effective and efficient work path for solving the problem, through the design, implementation and management of complex data acquisition and/or processing and/or modelling plans;
4) Taking into account regulatory, economic and logistic aspects;
5) Working in a research group or in an inter-disciplinary laboratory;
6) Organizing the work both within a team and individually;
7) Examining the overall results of a geophysical survey and evaluate any critical issues.
The degree of achievement of autonomy of judgment by each student is assessed through:
1) Examination tests of the individual course units, especially through the evaluation of the students' active participation in the exercises and moments of discussion, and of the results of their guided and autonomous study;
2) The assessment of the degree of autonomy acquired by the student during the work carried out as part of the internship and the preparation of the MS thesis.

Communication skills
During the MS degree course, the student is guided to acquire good skills in the communication of scientific research results and technical-scientific studies. This objective is achieved through specific training activities during the internship, the preparation of the MS degree thesis and the exercises and autonomous activities integrated into all the courses units. In particular, students are asked to use different technical-scientific communication systems, focused on different types of public:
1) Traditional written communication (technical-scientific reports, articles, etc.);
2) Oral communication;
3) Multimedia communication (audio/video);
4) Communication on digital media (blogs, websites, social networks, etc.).

These communication skills refer to:
1) The ability to expose a scientific or practical problem and its methods of solution with appropriate scientific rigor;
2) The ability to communicate the results of scientific research and of personal work in a scientifically correct way both to potential stakeholders and to a wide audience.
The degree of achievement of communication skills by the student is assessed through:
1) The evaluation of reports, oral or multimedia presentations prepared by the students for individual course units, both during exercises and laboratory activities or in the field, and as a result of autonomous in-depth analysis by the student on

topics covered during class lectures;
2) The evaluation of the presentation of the work carried out during the internship and the preparation of the MS thesis.

Learning skills
All the educational activities of the MS in Geophysics guide the students in acquiring learning skills that enable them to keep their knowledge, skills and abilities up-to-date, even when they enter the world of work. The structure of the MS in Geophysics is designed according to a pedagogical scheme oriented to the setting and solution of problems, which allows the students to acquire skills and abilities that can be used in very different work contexts (as a freelance, in the public sector, in companies, etc.) and in activities other than those of the geophysical sector. This is achieved by paying particular attention to the growth of the students' learning ability during the study course.

**Profilo professionale e sbocchi occupazionali**

Professional profile: Specialist in modeling of geophysical processes and in acquisition and analysis of geophysical data.

Function in a work context
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 carry out development and application activities of 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, management of natural resources and of the territory, both in the private and public sectors. This kind of 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.

Skills associated with the function
Graduates in Geophysics are able to use the most advanced methodologies to examine and describe, with extreme scientific rigor, the physical phenomena and processes that modify the territory, which is a strongly integrated system between the compartments of solid Earth, hydrosphere, cryosphere and atmosphere. They are able to develop the physical-mathematical formulation of phenomena and to implement this formulation in computational codes, through the most efficient and advanced programming languages, computing facilities and data processing systems. Therefore, they are able to develop "forward" modelling that allows to predict the evolution and effects of these phenomena on the environment, both at global and local scale, in order to minimize any negative impacts on the population and on society. At the same time, graduates in Geophysics are able to measure the different parts of the Earth with the most sophisticated techniques, in order both to monitor changes and to validate the software and modelling algorithms developed.
The skills of graduates in Geophysics can therefore address a wide range of environmental issues, related to land control, seismic risk, other natural risks, natural resource management and geophysical exploration. These skills may also include the implementation of algorithms and computer codes, developed by the graduates themselves independently or with the collaboration of other professionals. Therefore, graduates in Geophysics have complete control of the results of the developed or applied software and this makes them highly competitive in the job market, which nowadays requires important skills both in the field of software development and in the processing of large amounts of data. Graduates in Geophysics bring new skills with a strong technological-algorithmic base to the professions concerning territorial control, renewing and pushing the methodologies for the control of the different components of the Earth and the territory to today's technological frontier.

Professional opportunities
Graduates in Geophysics can find various immediate professional opportunities: technical roles in bodies or institutions that explicitly deal with geophysics (for example, the National Institute of Geophysics and Volcanology, which has over 1000 staff units, about half of which in the roles of researchers or technologists with permanent employment contracts, and the National Institute of Oceanography and Experimental 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 also playing a managerial role.
Finally, graduates in Geophysics can access training courses for teaching in Italy in lower secondary school (Scuola secondaria inferiore) in classes 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).

**Conoscenze per l'accesso**

The admittance to the MS 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.
The mathematical, physical and computer disciplines constitute the methodological substrate used in the geophysical field. Adequate knowledge of these disciplines is provided by many first-level university courses in science and engineering. Therefore, to be admitted to the MS in Geophysics, the student 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 credits in total, in the following scientific-disciplinary sectors (SSD): physics (FIS/01-08); mathematics (MAT/01-09); statistics (SECS-S/01-02); computer science (INF/01); information engineering (ING-INF/01-05, 07); chemistry (CHIM/01-07, 12); geosciences (GEO/01-12); civil engineering (ICAR/01-03, 06-09); industrial engineering (ING-IND/01-07, 09-12, 18-20, 28-30);
of which at least
- 15 credits in scientific-disciplinary sectors of physics and geosciences (FIS/01-08; GEO/01-12);
- 15 credits in scientific disciplinary fields of mathematics and computer science (MAT/01-09 and SECS-S/01-02; INF/01 and ING-INF/05).
The above criteria are met by graduates in Laurea (bachelor) degree courses of the class L-30 - Physical sciences and technologies and in many degree courses of the class L-34 - Geological sciences, including the Laurea in Scienze geologiche of the Università degli Studi di Milano.
The applicant must also have an adequate level of knowledge of the English language, comparable with the B2 level of the Common European Framework of Reference for the knowledge of languages (CEFR).
For all categories of candidates, the adequate personal preparation of applicants and the ability to communicate effectively in English are crucial elements for admission and are verified by the admission commission as specified below.
A syllabus illustrating the knowledge of physics, mathematics and computer science required for admission can be downloaded from the following link: https://geophysics.cdl.unimi.it/en/programme/informative-materials

The admission commission is entrusted with the following tasks:
a. Verification of the minimum curricular requirements, which have been indicated above, 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 student's 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.
Knowledge of the English language is not assessed 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.

**Struttura del corso**

The MS program is delivered in English, with a single curriculum.

Upon completion of the studies, the Laurea magistrale in Geophysics is obtained, in the class of Lauree magistrali LM-79 Scienze Geofisiche.
The normal duration of the MS in Geophysics is two years. To achieve the MS degree, the student must acquire 120 credits (CFU or ECTS).
Teaching is organized for each year of the course in two coordinated cycles, conventionally called semesters, with a minimum duration of 13 weeks each. There will be: lectures; guided practical exercises; assisted or autonomous activity in the field; an internship in laboratories within the University or external in public or private entities; seminar activities for in-depth study and orientation to the world of work.
CFU are a measure of the learning work required to the student and one CFU corresponds to a standard load of 25 hours of activity, including:
- 8 hours of frontal lessons with 17 hours of individual study;
- 12 hours of practical exercises with elements of theory with 13 hours of personal re-elaboration;
- 16 hours for autonomous practical exercises and field activities, with 9 hours of personal re-elaboration;
- 25 hours of training activities related to the internship or the preparation of the final exam.
The course units can be in a single module or in integrated modules, even multidisciplinary and with multiple teachers. The exams are generally held individually, but for some courses there are integrated oral, written, written and oral tests, and/or with a practical test. In the case of course units divided into modules held by different teachers, a teacher responsible for coordinating the assessment of the results and the related registrations is identified among them.
The acquisition by the student of the CFUs established for each course unit, in the case of course units divided into several modules where this is provided, for each of the modules that comprise it, is subject to passing the relative exams, which give rise to a vote out of thirty.

Study plan definition and submission for approval
During the first year, the student presents the study plan, outlining a learning path whose specificity is dictated by the choice of the characterizing course units and akin and integrative course units. The study plan also contains an indication of the course units chosen by the student among all the activated course units proposed by the University, as long as they are consistent with the training project. The choice will be submitted for approval by the teaching board, following an investigation conducted by the evaluation commission of the study plans.
The deadlines and the procedures will be announced on the website. See the page:
https://www.unimi.it/en/study/bachelor-and-master-study/following-your-programme-study/plan-study
Training activities belonging to the University project for the development of soft skills may be also included in the student's study plan. They have compulsory attendance, a defined number of places available and they can be selected by students only if they have been accepted by the Master’s degree program to which students belong. For more details, please refer to the following web pages: https://geophysics.cdl.unimi.it/en/courses and https://www.unimi.it/en/study/bachelor-and-master-study/following-your-programme-study/soft-skills

Lecture timetable
The first Semester starts on September 29, 2025 and ends on January 23, 2026 The second Semester starts on February 23, 2026 and ends on June 19, 2026
The course timetable will be available at https://www.unimi.it/en/node/128/

Testing and assessment procedures
Each course is followed by an exam, usually in the form of a written or oral test (or a combination of the two). Exam grade are calculated on a 30-point scale, 18/30 is the minimum passing grade.

Procedures for exam registration and admittance
Exam sessions are scheduled during recess at the end of each semester. For each course, 6 tests are scheduled per academic year.
https://geophysics.cdl.unimi.it/en/study/exams

**Area didattica**
The course activities are held in the Città Studi Campus, in Milan.

**Laboratori didattica**
Laboratory of Geophysics for the environment and the cultural heritage (https://distad.unimi.it/en/research/research-facilities/research-labs/earth-observation-and-modelling/geophysics-environment-and-cultural-heritage-gech-lab)
Laboratory EEM Team for water and exploration
High performance computing Lab (https://distad.unimi.it/en/research/research-facilities/research-labs/earth-observation-and-modelling/high-performance-computing-laboratory)
Numerical modeling of geodynamic processes Laboratory (https://distad.unimi.it/en/research/research-facilities/research-labs/earth-observation-and-modelling/numerical-modeling-geodynamic-processes)
SAR-GPS Laboratory (https://distad.unimi.it/en/research/research-facilities/research-labs/earth-observation-and-modelling/sar-gps-laboratory)

**Biblioteche**

Students of the MS (Laurea magistrale) in Geophysics can find material for basic and detailed study at the "A. Desio" Library of Earth sciences (https://www.sba.unimi.it/en/libraries/sterra/1877.html) located in via Mangiagalli 34,
in the BICF Library of biology, computer science, chemistry and physics (https://www.sba.unimi.it/en/libraries/13453.html) located in via Celoria 18, and in the Digital Library (https://www.sba.unimi.it/en/digital-library/46.html).

**Tutorato**

The didactic and ongoing tutoring is carried out by the tutor teachers, coordinated by the contact person for the study guidance, through periodic collegial meetings (usually quarterly) and, at the request of individual students or groups of students, during reception hours.

**Prove di lingua / Informatica**

To obtain the degree, those who do not hold an Italian high school diploma or bachelor's degree must demonstrate proficiency in Italian at the A2 or higher level per the Common European Framework of Reference for Languages (CEFR). This level must be demonstrated prior to completing the course programme in one of the following ways:
- by submitting a certificate of A2 or higher level issued no more than three years prior to the date of submission. You will find the list of language certificates recognized by the University at: https://www.unimi.it/en/node/349). The language certificate must be submitted to the University Language Centre (SLAM) via the Language Test category of the InformaStudenti service: https://informastudenti.unimi.it/saw/ess?AUTH=SAML;
- via a entry-level test administrated by SLAM that can only be taken only once and is compulsory for all students who do not have a valid language certificate.

Those who fail to reach A2 level will have to attend one or more than one 60-hour Italian course(s) geared to their level.
Those who do not take the entry-level test or fail to pass the end-of-course test after six attempts will have to obtain language certification privately in order to earn the 3 credits of Additional language skills: Italian.

**Obbligo di frequenza**

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.

**Caratteristiche Tirocinio**

A compulsory internship is provided for all students, which can be carried out both in the University's research laboratories and in external bodies. For Italian students the internship (internal or external) is equal to 9 CFU. For foreign students the internship (internal or external) is equal to 6 CFU.

**Caratteristiche della prova finale**

The final exam consists in carrying out a theoretical or applied research activity, in the delivery of a written paper (MS thesis), and in the presentation and discussion of the work done in a public session. The MS thesis is written, presented and discussed in English.
The MS thesis is prepared by the student under the guidance of a supervisor, teacher of the master's degree course. At the request of the supervisor and/or the student, one or more co-supervisors (professors from the University of Milan outside the MS course, but also researchers from other universities or organizations, including international ones) can be designated to support research for specialized aspects.
The assignment of the topic on which the student carries out the MS thesis is deliberated by the tutoring commission, following a request presented by the student, before starting the work for the thesis, and countersigned by the proposed supervisor. The development of the thesis requires regular and assiduous activity by the student in the laboratory or in any case with a continuous updating of the supervisor and co-supervisors by the student.
At the end of the work, the student prepares a written paper describing the work carried out and, after approval by the supervisor and after the acquisition of the educational credits required for the achievement of the MS degree, except for those reserved for the final exam, can apply for the final exam. During the MS final session, the student illustrates his/her work to an examination committee, with which he/she discusses the work done and the results obtained.
The composition and methods of appointment of the graduation examination commission comply with the University Didactic Regulations.

To be admitted to the final exam students must have achieved all the credits required by all the topic listed in the second cycle program, except those reserved to the final examination.
https://www.unimi.it/en/study/bachelor-and-master-study/graduation

## *ESPERIENZA DI STUDIO ALL'ESTERO NELL'AMBITO DEL PERCORSO FORMATIVO*

The University of Milan supports international mobility by providing its students with the opportunity to spend study and internship periods abroad. It is a unique chance to enrich your educational path in a new exciting environment.
The agreements entered into by the University with over 300 universities from the 27 EU member countries under the European Erasmus+ programme allow regularly enrolled students to carry out part of their studies at one of the partner universities or to undertake internships at companies, training and research centres and other organizations.
Similar international mobility opportunities are provided outside Europe, through agreements with a number of prestigious institutions.

**Cosa offre il corso di studi**

Students have the opportunity to attend course units at foreign universities. They can also spend some months at foreign universities, research centers and international organizations to complete their MS thesis. Host institutions can be chosen among those with which the course faculties have research cooperation.

**Modalità di partecipazione ai programmi di mobilità - mobilità Erasmus**

The students of the University of Milan can participate in mobility programmes, through a public selection procedure.
Ad hoc commissions will evaluate:
· Academic career
· the candidate's proposed study programme abroad
· his/her foreign language proficiency
· the reasons behind his/her application
Call for applications and informative meetings
The public selection for Erasmus+ mobility for study generally begins around February each year with the publication of a call for applications specifying destinations and requirements. Regarding the Erasmus+ Mobility for Traineeship, the University of Milan usually publishes two calls a year enabling students to choose a destination defined by an inter-institutional agreement or to find a traineeship position on their own.
The University organizes informative meetings to illustrate mobility opportunities and rules for participation.
Erasmus+ scholarship
The European Union grants the winners of the Erasmus+ programme selection a scholarship to contribute to their mobility costs, which may be supplemented by the University funding for disadvantaged students.
Language courses
Students who pass the selections for mobility programmes can benefit from intensive foreign language courses offered each year by the University Language Centre (SLAM).
https://www.unimi.it/en/node/8/
Learn more at https://www.unimi.it/en/node/274/
For assistance, please contact:
International Mobility Office
Via Santa Sofia 9 (second floor)
Tel. 02 503 13501-12589-13495-13502
Contacts: InformaStudenti; mobility.out@unimi.it
Student Desk booking through InformaStudenti

## *MODALITA' DI ACCESSO: 1° ANNO LIBERO CON VALUTAZIONE DEI REQUISITI DI ACCESSO*

### *ANNO DI CORSO NON DEFINITO Attività formative obbligatorie*

| Erogazione | Attività formativa | Modulo/Unità didattica | Cfu | Settore |
|---|---|---|---|---|
| *1 semestre* | EARTH MATERIALS: GENESIS, COMPOSITION, EVOLUTION, PROPERTIES<br>*Students who, before enrolling on the Master's degree program, have already earned more than 12 academic credits (CFU) for courses in the GEO/07, GEO/08, GEO/09 can replace this course with one chosen from among the core courses of the Master's degree program in Earth Sciences in the GEO/02, GEO/03, GEO/04, GEO/05, GEO/07, GEO/08, GEO/09 subject areas* | | 6 | (1) GEO/07,<br>(3) GEO/08,<br>(2) GEO/09 |
| *1 semestre* | GEOLOGICAL ENVIRONMENTS AND STRUCTURES<br>*Students who, before enrolling on the Master's degree program, have already earned more than 12 academic credits (CFU) for courses in the GEO/02, GEO/03, GEO/04, GEO/05 can replace this course with one chosen from among the core courses of the Master's degree program in Earth Sciences in the GEO/02, GEO/03, GEO/04, GEO/05, GEO/07, GEO/08, GEO/09 subject areas* | | 6 | (2) GEO/02,<br>(2) GEO/03,<br>(1) GEO/04,<br>(1) GEO/05 |
| *1 semestre* | INTRODUCTION TO CONTINUUM PHYSICS | | 6 | (1) FIS/05,<br>(1) FIS/04,<br>(2) FIS/03,<br>(1) FIS/02,<br>(1) FIS/01 |
| *2 semestre* | ADVANCED TOPICS IN PHYSICS<br>*Students who, before enrolling on the Master's degree program, have already earned more than 12 academic credits (CFU) for courses in the FIS/01, FIS/02, FIS/03, FIS/04, FIS/05, FIS/07 subject areas, may replace this course with one chosen from among the core courses of the Master's degree program in Physics in the FIS/01, FIS/02, FIS/03, FIS/04, FIS/05, FIS/07 subject areas* | | 6 | (1) FIS/07,<br>(1) FIS/05,<br>(1) FIS/04,<br>(1) FIS/03,<br>(1) FIS/02,<br>(1) FIS/01 |
| | | Totale CFU obbligatori | 24 | |

### *Altre attività a scelta*

**The student must choose four of these courses, of which at least one for each of the GEO/10, GEO/11 and GEO/12 subject areas**

| | | | | |
|---|---|---|---|---|
| *1 semestre* | ELECTRICAL, ELECTROMAGNETIC AND GRAVIMETRIC METHODS FOR ENVIRONMENT AND EXPLORATION | | 6 | GEO/11 |
| *1 semestre* | PHYSICS OF THE ATMOSPHERE | | 6 | (1) FIS/06,<br>(5) GEO/12 |
| *1 semestre* | PHYSICS OF THE HYDROSPHERE AND THE CRYOSPHERE | | 6 | GEO/12 |
| *1 semestre* | SEISMOLOGY AND LABORATORY | | 6 | GEO/10 |

| | | | | |
|---|---|---|---|---|
| *2 semestre* | SEISMIC AND WAVE FIELD EXPLORATION | | 6 | GEO/11 |
| *2 semestre* | SOLID EARTH GEOPHYSICS | | 6 | GEO/10 |
| **The student must choose three of these courses** | | | | |
| *1 semestre* | FISICA DELL'AMBIENTE | | 6 | FIS/07 |
| *1 semestre* | GEOSTATISTICAL METHODS FOR GEOPHYSICS | | 6 | GEO/12 |
| *1 semestre* | INTERNATIONAL, EUROPEAN, AND COMPARATIVE ENVIRONMENTAL LAW | | 6 | (2) IUS/13, (1) IUS/14, (3) IUS/02 |
| *2 semestre* | DATA ANALYTICS, FORWARD AND INVERSE MODELING: GEOPHYSICAL AND ENVIRONMENTAL FLUID DYNAMICS | | 6 | GEO/12 |
| *2 semestre* | METODI PER L'ELABORAZIONE, ANALISI E RAPPRESENTAZIONE DI DATI GEOFISICI | | 6 | ICAR/06 |
| *2 semestre* | NUMERICAL MODELLING OF GEODYNAMIC PROCESSES | | 6 | GEO/10 |
| *2 semestre* | TECTONOPHYSICS | | 6 | GEO/10 |
| *2 semestre* | THE BASICS OF PROBABILITY THEORY AND STATISTICS | | 6 | (1) SECS-S/01, (4) ICAR/06, (1) MAT/06 |
| **The student must choose two of these courses and the other courses offered by the University** | | | | |
| *1 semestre* | SEISMIC IMAGING | | 6 | GEO/11 |
| *2 semestre* | FIELD COURSE | | 6 | (1) GEO/10, (1) GEO/12, (4) GEO/11 |
| *2 semestre* | FORMATION OF STARS AND PLANETS | | 6 | FIS/05 |
| *2 semestre* | INTRODUCTION TO DYNAMIC AND SYNOPTIC METEOROLOGY | | 6 | GEO/12 |
| *2 semestre* | SPACEBORNE EARTH OBSERVATION | | 6 | (3) ICAR/06, (3) GEO/10 |
| *2 semestre* | WELL LOGGING | | 6 | GEO/11 |
| **Foreign students will be assessed for Italian language proficiency (Additional language skills: Italian). For further information, read the section "Prove di lingue/informatica". Italian students will be required to complete an internal or external internship awarding 9 CFU, while for foreign students the internal or external internship will award 6 CFU.** | | | | |
| | Additional Language Skills: Italian (3 ECTS)<br>*compulsory for foreign students* | | 3 | NN |
| | INTERNSHIP (6 ects) | | 6 | NN |
| | INTERNSHIP (9 ects) | | 9 | NN |
| | | | | |
| ***Attività conclusive*** | | | | |
| | FINAL DISSERTATION | | 33 | NN |
| | | Totale CFU obbligatori | 33 | |