



UNIVERSITA' DEGLI STUDI DI PAVIA

DIPARTIMENTO DI
SCIENZE DELLA TERRA E DELL'AMBIENTE

MASTER'S DEGREE
(LAUREA MAGISTRALE)

IN

APPLIED GEOLOGICAL SCIENCES
SCIENZE GEOLOGICHE APPLICATE

(ACADEMIC YEAR 2017/18)

STUDENT GUIDEBOOK

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A BRIEF INTRODUCTION TO THE MASTER'S DEGREE

The bilingual Master's Degree in Applied Geological Sciences (Italian Ministerial class LM-74) is aimed to provide its graduates with a cultural profile that combines scientific disciplines with specific skills in the main fields of Earth Sciences' application.

Teaching languages are Italian and English. The curriculum was set up to cover a wide range of topics and to adapt to our students' scientific interests.

Requirements and adequacy of applicants' preparation will be evaluated by the Didactic Council through an interview.

To apply to this course, you have to fulfil the following conditions:

- a) a Bachelor's degree in Geological Sciences (ex D.M. 270/04) or in Earth Sciences (ex D.M. 509), or another Degree in a course that has not less than 72 credits in the GEO/* area, or another title accomplished abroad, properly recognized by the Didactic Council;
- b) knowledge of English, documented by a respective certificate (level B2 of the Common European Framework of Reference for Languages). If applicants do not have this certification, their English level will be tested during the preliminary interview.

The graduates in Applied Geological Sciences are able to work in the following areas:

- geological investigation and geognostic prospections applied to the organization of engineering activities;
- geological prospection of the subsoil for the research and the employment of hydrocarbon deposits and geothermic energy
- geological prospection of the subsoil for employment and safeguard of groundwater resources;
- basic and thematic geological cartography, including digital cartography and territorial ITC;
- environmental impact assessment and restoration of dismissed mining sites;
- evaluation and prevention of cultural heritage's degradation and its conservations and valorisation;
- assessment of natural hazards
- scientific research.

Our graduates usually exert their skills in companies and professional studies, in local (Municipalities, Districts, Regions, Mountain Communities), national (Ministries) and international (UNESCO, FAO etc.) authorities, in public and private research institutes (Universities, CNR, INGV, Civil Defence etc.).

At the end of the 2 years, the student must have collected 120 credits.

During these two years, students must get:

- 18 credits in geological-paleontological courses (GEO/01, GEO/02 and GEO/03);
- 24 credits in applicative geomorphological-geological courses (GEO/04 and GEO/05);
- 18 credits in mineralogical-petrographic-geochemical courses (GEO/06, GEO/07, GEO/08 and GEO/09);

The amount of characterizing courses are eight.

The curriculum requests at least:

- 18 credits in complementary activities, that means three courses, 6 credits each;
- 12 credits of optional courses that can be taken from the didactic offer of the entire Athenaeum, including Geology courses.

Please note that the Final Exam equals 24 credits, and the Traineeship 5 credits. The Traineeship contributes to accomplish the goals of this Master's Degree. The Traineeship can be carried out in institutions or companies that have an agreement with the University of Pavia.

Besides, for Occupational Skills, 1 credit will be recognized to students attending integrative didactic activities.

Master's Degree courses frontal lectures are integrated with practical exercises in labs and a large number of field trips: this way, the geologist not only acquires sound theoretical expertise, but also how to apply it practically in the field. As the Athenaeum recognizes the importance of applied activities, it supports its didactic with suitable funding.

It is recommended that students may accomplish part of their career abroad using one of the student's mobility programmes, recognized by UE Universities (ERASMUS+, ERASMUS Traineeship). Furthermore, if a student wants to prepare and develop his/her Degree Thesis, he/she is also allowed to study at other Universities, even if they are not included in the Erasmus student mobility program. In this case, his/her mentor has to approve the student's request with a written declaration that has to be transmitted to the Student Office, in order to guarantee the insurance of the student.

The Graduates in Applied Geological Sciences can apply for the PhD Program of our Department of Earth and Environmental Sciences. The main subject of our PhD in Earth and Environmental Sciences is the study of the Earth system in its different abiotic and biotic components.

The PhD is finalized to acquire distinct and sound scientific competences in all fields of the Earth and Natural Sciences. PhD students are prepared to develop their own research within international collaborations with universities, research centres and/or companies.

CURRICULUM

MASTER'S DEGREE IN APPLIED GEOLOGICAL SCIENCES 2017/2018 – 2018/2019

Characterizing courses: geology and paleontology (18 CFU)	year	period	credits	subject
<i>Basin analysis and petroleum geology</i> (mandatory)	1	1 e 2	12	GEO/02
Micropaleontologia applicata (<i>Applied Micropaleontology</i>)	1	1	6	GEO/01
Geologia strutturale (<i>Structural Geology</i>)	1	1	6	GEO/03
<i>Seismic interpretation for geological modelling</i>	2	2	6	GEO/03
Characterizing courses: geomorphology and applied geology (24 CFU)				
Laboratorio di GIS e Telerilevamento (<i>GIS Lab and Remote sensing</i>) (mandatory)	1	1 e 2	12	GEO/04
Geomorfologia applicata e impatti geoambientali (<i>Applied Geomorphology and geo-environmental impacts</i>)	1	1	6	GEO/04
Idrogeologia applicata (<i>Applied Idrogeology</i>)	1	2	6	GEO/05
<i>Landslide Hazard and Risk</i>	1	2	6	GEO/05
Geomeccanica (<i>Geomechanics</i>)	2	1	6	GEO/05
<i>Geopedology</i>	2	2	6	GEO/04
Characterizing courses: mineralogy, petrography and geochemistry (18 CFU)				
Composizione della litosfera (<i>Composition of the lithosphere</i>)	1	2	6	GEO/07
Applicazioni mineralogiche e petrografiche per i beni culturali (<i>Mineralogical and Petrographic Applications for Cultural Heritage</i>)	1	2	6	GEO/09
<i>Environmental geochemistry</i>	2	1	6	GEO/08
Petrografia applicata (<i>Applied Petrography</i>)	2	1	6	GEO/09
Complementary courses				
3 courses among the following:				
<i>Analytical methodologies applied to geosciences</i>	1	1	6	GEO/06
Geotecnica (<i>Geotechnics</i>)	1	2	6	ICAR/07
Cristallografia (<i>Crystallography</i>)	2	1	6	GEO/06
Paleoclimatologia e cambiamento climatico globale (<i>Paleoclimatology and Global Climatic Change</i>)	2	1	6	GEO/01
<i>Applied geophysics and underground surveys</i>	2	2	6	GEO/11
Gemmologia (<i>Gemmology</i>)	2	2	6	GEO/06

As to characterizing courses, students must get:

- 18 credits in Geology and Paleontology (GEO/01, GEO/02 and GEO/03);
- 24 credits in Geomorphology and Applied Geology (GEO/04 and GEO/05);
- 18 credits in Mineralogy, Petrography and Geochemistry (GEO/06, GEO/07, GEO/08 and GEO/09).

The sum of the characterizing activities is eight.

Students must also get:

- 18 credits in supplementary courses (3 courses of 6 credits);
- 12 credits in optional courses, picking them from the offer of the entire University of Pavia (geological courses included).

In the second year second period, students attend the Traineeship (5 credits) and prepare their Degree Thesis (24 credits). These two activities can be associated. Besides, students will get 1 credit in "Occupational Skills" if they attend a certain number of seminars.

At the end of the 2 years, the student must have completed 120 credits.

Programs of the courses can be consulted at this link <http://www.unipv.eu/site/home/didattica/catalogo-insegnamenti.html>

OPTIONAL COURSES

During the two years, students must get **12 credits in optional courses**

These activities could be picked from the offer of the entire Athenaeum, **including those of geological area.**

In this following table, a list of other eligible teachings is reported*:

Courses from the Master's Degree in Natural Sciences	credits	SSD
Metodi di indagine paleontologica per la ricerca e la museologia scientifica (<i>Paleontology Methods for Scientific Research and Museology</i>)	6	GEO/01
Gestione del patrimonio geologico (<i>Geological Heritage's Management</i>)	6	GEO/02
Courses from the Undergraduate Degree in Geological Sciences		
Campagna di Geologia Regionale (<i>Regional Geology Campaign</i>)	6	GEO/02
Vulcanologia (<i>Vulcanology</i>)	6	GEO/08
Geomateriali: genesi, depositi e applicazioni (<i>Geomaterials: genesis, deposit and applications</i>)	6	GEO/09
Courses from the Undergraduate Degree in Natural Sciences and Technology		
Mineralogia sistematica (<i>Systematic Mineralogy</i>)	6	GEO/06
Museologia (<i>Museology</i>)	6	GEO/06
Didattica delle Scienze (<i>Science Didactic</i>)	6	BIO/02
Geobotanica (<i>Geobotany</i>)	6	BIO/03
Comunicazione digitale e multimediale (<i>Digital and Multimedia Communication</i>)	6	ING-INF/05
Course from the Undergraduate Degree in Management		
Governo e valorizzazione delle risorse naturali (<i>Natural Resources Management and Promotion</i>)	6	GEO/09

* Students cannot choose any teachings already selected in their past career

GENERAL INFORMATION

The Department of Earth and Environmental Sciences

The Department of Earth and Environmental Sciences grants degree programs in Geology and Applied Geology. Classes are held at the "Cravino" campus in a modern facility equipped with classrooms, laboratories and study rooms. An optimally staff/student ratio allows for continuous interactions that are extremely profitable both in class, in the laboratory, and during the various field activities.

President of the Didactic Council

Prof. Riccardo Tribuzio

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e-mail: didattica@dsta.unipv.it

Monday to Friday: 9 AM to 12 PM

Student Office via Ferrata, 5 – 27100 Pavia

website: <http://www.unipv.eu/site/home/naviga-per/studenti/segreteria-studenti-e-ufficio-tasse/segreteria-studenti-di-facolta/scienze-matematiche--fisiche-e-naturali.html>

Monday, Thursday, Friday: 9.30 AM to 12.00 PM

Tuesday: by appointment only

Wednesday: by appointment only from 13.45 PM to 16.15 PM

Lesson calendar

The academic year is divided in two semesters. First semester starts at the beginning of October and ends halfway through January. Second semester starts at the beginning of March and ends halfway through June.

All courses are held in the Department of Earth Sciences and the Environment, Geology Section, via Ferrata 1.

The Lesson calendar is available on our Department's website <http://geologia.unipv.it/frequentare/orari-delle-lezioni/>

Practical activities are held in our Department's classrooms and labs. Our courses include also field trips in Italy and abroad.

ENROLMENT

To enroll, a student must have any degree in Geology recognized as suitable by the Didactic Council.

The degree must be translated and validated by the Italian embassy (or another EU embassy, if there's no Italian embassy) in the Country of the applicant's origin .

Knowledge of Italian Language

If a Non-EU applicant hasn't got a C1 or C2 level/ CELI certification, he/she must take an Italian Language exam at the University Linguistic Center in Strada Nuova 65, Pavia, on 2nd September 2016, at 8.45.

Interview

Applicants to Applied Geological Sciences Master's Degree Course will be interviewed by a committee appointed by the Didactic Council.

In order to be interviewed via Skype, applicants must send an email to presidente.geologia@unipv.it

Please read the call on www.unipv.eu for further information.

INTERNATIONAL STUDENTS

Exchange programs

In 2014 a new EU program was launched for permanent education activities: Erasmus+. It is designed to gather and integrate all European cooperation initiatives in the fields of education, youth and sports. The Erasmus+ program offers to university students several exchange activities of a 3 to 12 months standard period. Scholarships are granted that partly contribute to the mobility costs. The most important innovation is that students can benefit from available scholarships in order to support their study or their traineeship, unless the period spent abroad is no longer than 12 months (Undergraduate and Masters' Degree).

Erasmus

The Erasmus program is expected to provide scholarships to students who want to study in another European university for a part of their curriculum. Their study and other formative activities are recognised by the university of provenience. Thus, students can follow lectures and take exams that previously have been approved as equivalent to the Italian study program at the foreign universities,. Moreover, the Erasmus program allows to conduct and recognised the activities connected to the traineeship or the graduation thesis.

Erasmus Traineeship

It enables students with Undergraduate and Master's Degree as well as PhD candidates to conduct a traineeship abroad for a period of 2 to 12 months, even after degree was obtained. It is an interesting program for students of the Geological Sciences Undergraduate Degree, since it may be used to cover the mandatory traineeship.

The traineeship can be carried out in cooperation with: Enterprises; Education and Research Centres, Organisations of private, public and 3rd sector; Universities; higher education Institutes (ex. Laboratories, Libraries, International Relationship Institutes etc.); ONLUS and many others national and international Organisations (ex. ONU, UNESCO and others specialised Institutions of United Nations). Students can do Erasmus traineeship in all the 28 States of the EU, Island, Liechtenstein and Norway as well as in Turkey. Soon western Balkans will be also available. It is up to the student to find a hosting enterprise or institution. The Office of International Mobility offers a series of tools to search and contact the hosting partner. Once a host is found, the candidate should provide a letter of reception filled and signed by the host.

Erasmus Responsible:

prof. Elisa Sacchi

E-mail elisa.sacchi@unipv.it

FIELD TRIPS

Our frontal lectures are integrated by many field trips, so that our students may get sound practical skills and learn how to apply their knowledge.

Here is the list of 2017/18 field trips, as an example of our program activities.

<i>Applied Geomorphology</i> Oltrepò Pavese (Pavia) Geomorfologia applicata e impatti ambientali
<i>Landslides Monitoring</i> Oltrepò Pavese (Pavia) Landslide Hazard and Risk
<i>Alpine Landslides</i> Valle Antrona (Verbania) Landslide Hazard and Risk
<i>The Ligurian Jurassic Ophiolites</i> Levanto e Bonassola (La Spezia) Composizione della litosfera
<i>The association of ophiolites and continental crust rocks from northwest Corsica</i> Corsica (Francia) Composizione della litosfera
<i>The peridotite massif from Lanzo (Western Alps)</i> Caselette (Torino) Composizione della litosfera
<i>The Permian magmatic system from Ivrea-Verbano Zone (Western Alps)</i> Val Sesia (Vercelli) Composizione della litosfera
<i>The mantle-continental crust association from Finero (Ivrea-Verbano Zone)</i> Val Canobina (Verbania) Composizione della litosfera
<i>Electric and Electromagnetic Geophysical Surveys</i> Oltrepò Pavese (Pavia) Applied Geophysics and Underground Surveys
<i>Visit to Boario Terme hot springs and factory – hydrogeological surveys</i> Val Camonica (Brescia) Idrogeologia applicata.
<i>Triassic basins from Dolomites</i> Val di Fassa Basin Analysis and sequence stratigraphy

SERVICES AND FACILITIES

Applied Geological Sciences Master's Degree Course's classes are held in the Department of Earth and Environment Sciences, at the "Cravino" campus in a modern facility equipped with classrooms, laboratories and study rooms.

For more info please visit our website: <http://dsta.unipv.it>.

PC labs and Wi-fi

There are several computer rooms available for student use. In all, there are 17 computer rooms where students can take lessons, computer classes, and make use of self-study facilities. Faculties or departments run the computer rooms, and each of them has their own rules for access and opening times. For more information: <http://www.unipv.it/webauale>

Another service offered by the University of Pavia is a free Wi-Fi connection: connect to the internet on your own personal laptop or mobile device in almost all the buildings of the university using your atheno name and password.

Libraries

Students will be provided with a wide and complete offer of about 35 libraries run by different faculties and departments. The whole library system contains over 972.000 books and about 19.000 printed periodicals, thus covering the whole range of academic teaching and research offer. All material owned by the different academic libraries is listed in an electronic catalogue, called OPAC (On-line Public Access Catalogue).

To get more detailed information on the complete list of academic libraries and on their location, opening times and specific rules of each of them, please refer to the following website:

<http://libraries.unipv.it/>

To consult the OPAC, please refer to:

<http://opac.unipv.it/opac/ricerche.html>

Welcome Point

The Welcome Point (<http://welcomepoint.unipv.it/>) gives support and advice to incoming international students, researchers and university professors visiting the University of Pavia. It collaborates with other university offices and provides useful information on various topics of interest for our guests. In particular, it gives information on:

- Enrolment at the university
- Permit of stay (*it. permesso di soggiorno*)
- Housing
- Halls of Residence
- Fiscal code (*it. codice fiscale*)
- University canteens (*it. mensa*)
- Health insurance
- Campus info
- University Sports Centre (CUS)
- Unibus pass
- Scholarships
- Opening a bank account
- Welcome day
- Italian courses or self-study at the University Language Centre
- General information on the University of Pavia and Pavia

Language Centre

The Language Centre (<http://cla.unipv.it/>) organizes Italian courses three times a year, in September, October and February.

The courses are all taught by qualified Italian teachers to adults who study Italian as a second or foreign language. Italian courses are mainly addressed to Erasmus+ students, international exchange students and students enrolled at University of Pavia. However, they are also open to anyone who is interested in learning Italian.

EARTH AND ENVIRONMENTAL SCIENCES PhD

The Ph.D. represents the highest level in University education.

To be admitted to the PhD Program you must apply to an official call, published generally in July.

The Ph.D. is a three academic years program and it ends with a lecture in which the candidate presents an original research.

The Ph.D. is aimed not only at giving an advanced preparation, but also to help young researcher to become more autonomous and confident.

The central topic of the [Ph.D. in Earth and Environment Sciences](http://phd-dsta.unipv.it) (<http://phd-dsta.unipv.it>) is the study of the Earth's system in its abiotic and biotic components.

Our Ph.D. degree is aimed to acquire highly qualified scientific competences in all the areas of the Earth and Natural Sciences. Through a wide network of international collaborations with universities, research institutions and companies, our PhD students can develop their own research.

These are our PhD main research fields:

- retrieval, sustainable use and defence of natural resources (geothermal science, water resources, hydrocarbons, minerals);
- geological risks evaluation and mitigation (hydrogeological, seismic and volcanic);
- conservation and management of cultural heritage;
- geodynamics, with particular attention to petrogenesis and to the study of the minerals included in the metamorphic rocks (high pressure).