UNIVERSITÀ
DI PAVIA

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 2019/20)

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 students with a cultural profile that combines scientific disciplines with specific skills in the main fields in which Earth Sciences can be applied.

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 can find a job 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 23 credits, and the Traineeship 6 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 Soft Skills, 1 credit will be recognized to students attending integrative didactic activities.

Master's Degree courses lectures are combined 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 on field. Our university supports field activities with suitable funding.

It is recommended that students may accomplish part of their career abroad, participating in student mobility programmes, recognized by EU Universities (ERASMUS+, ERASMUS Traineeship). Furthermore, if a student wants to prepare and develop his/her Degree Thesis abroad, 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.

Applied Geological Sciences graduates can apply for the PhD Program in Earth and Environmental Sciences, offered by our Department. The main subject of the PhD 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
1st year 2019/20 – 2nd year 2020/21

Characterizing courses: geology and paleontology (18 CFU)	**year**	**period**	**credits**	**subject**
Basin analysis and petroleum geology	1	1 and 2	12	GEO/02
Micropaleontologia applicata *(Applied Micropaleontology)*	1	1	6	GEO/01
Geologia strutturale *(Structural Geology)*	1	1	6	GEO/03
Seismic interpretation for geological modelling	2	2	6	GEO/03
Characterizing courses: geomorphology and applied geology (24 CFU)				
Laboratorio di GIS e Telerilevamento *(GIS Lab and Remote sensing)*	1	1 and 2	12	GEO/04
Geomorfologia applicata e impatti geoambientali *(Applied Geomorphology and geo-environmental impacts)*	1	1	6	GEO/04
Idrogeologia applicata *(Applied Idrogeology)*	1	2	6	GEO/05
Landslide Hazard and Risk	1	2	6	GEO/05
Geomeccanica *(Geomechanics)*	2	1	6	GEO/05
Geopedology	2	2	6	GEO/04
Characterizing courses: mineralogy, petrography and geochemistry (18 CFU)				
Composizione della litosfera *(Composition of the lithosphere)*	1	1 and 2	12	GEO/07
Analytical methodologies applied to geosciences	1	1	6	GEO/06
Applicazioni mineralogiche e petrografiche per i beni culturali *(Mineralogy and Petrography Applied to Cultural Heritage)*	1	2	6	GEO/09
Geochimica ambientale *(Environmental geochemistry)*	2	1	6	GEO/08
Petrografia applicata *(Applied Petrography)*	2	1	6	GEO/09
Complementary courses				
3 courses among the following:				
Geotecnica *(Geotechnics)*	1	2	6	ICAR/07
Cristallografia *(Crystallography)*	2	1	6	GEO/06
Paleoclimatologia e cambiamento climatico globale *(Paleoclimatology and Global Climatic Change)*	2	1	6	GEO/01
Physical properties of minerals and rocks	2	1	6	GEO/06
Applied geophysics and underground surveys	2	2	6	GEO/11
Gemmologia *(Gemmology)*	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 no more than 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 (6 credits) and prepare their Degree Thesis (23 credits). These two activities can be associated. Besides, students will get 1 credit in "Soft 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.**
Students cannot choose any teachings already selected in their past career.

Courses from the Master's Degree in Applied Geological Sciences	**credits**	**SSD**
Didattica delle Geoscienze *(Geoscience Education)*	6	GEO/04
Normativa per la progettazione geologica e ambientale *(Geological and Environmental Design Law)*	6	GEO/05
Materiali extraterrestri *(Extraterrestrial materials)*	6	GEO/06

Courses from the Master's Degree in Natural Sciences		
Gestione del patrimonio geologico *(Geological Heritage's Management)*	6	GEO/02
Mineralogia sistematica *(Systematic Mineralogy)*	6	GEO/06
Complementi di matematica per l'insegnamento *(Mathemathics Didactic)*	6	MAT/04
Courses from the Undergraduate Degree in Geological Sciences		
Campagna di Geologia Regionale *(Regional Geology Campaign)*	6	GEO/02
Vulcanologia *(Vulcanology)*	6	GEO/08
Geomateriali: genesi, depositi e applicazioni *(Geomaterials: genesis, deposit and applications)*	6	GEO/09
Courses from the Undergraduate Degree in Natural Sciences and Technology		
Museologia *(Museology)*	6	GEO/06
Didattica delle Scienze *(Science Didactics)*	6	BIO/02
Geobotanica *(Geobotany)*	6	BIO/03
Comunicazione digitale e multimediale *(Digital and Multimedia Communication)*	6	ING-INF/05
Course from the Undegraduate Degree in Management		
Governo e valorizzazione delle risorse naturali *(Natural Resources Management and Promotion)*	6	GEO/09

LM PLUS

Starting with 2019/20, a few selected students will be able to apply to LM+ (Laurea Magistralis Plus) option, a project born by a cooperation between university and companies.

LM+ provides students that choose it with the opportunity of attending a two-term traineeship in our partner companies. The master's course will last 5 terms instead of 4.

Students applying for LM+ option will be selected by a special commission, consisting of professors and a companies' representative. Their number may vary depending on partner companies' needs (approximately 3-4).

During their traineeship, students will be tutored by a professor and a company member; these two tutors will cooperate in order to help students to achieve the objectives defined by the traineeship project.

During their period in the companies, students will be funded with minimum 500 euros/month.

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 gives the opportunity for continuous and useful interactions in class, in the labs, and on the field.

President of the Didactic Council
Prof. Miriam Cobianchi
e-mail: presidente.geologia@unipv.it

Segreteria Didattica via Ferrata, 1 – 27100 Pavia
Tel +39 0382.985021 – 985244 - 985379
e-mail: didattica@dsta.unipv.it
Monday to Friday: 9 AM to 12 PM

Student Office via Ferrata, 5 – 27100 Pavia
website**:** http://wcm-3.unipv.it/site/home/ateneo/amministrazione/area-didattica-e-servizi-agli-studenti/servizio--segreterie-studenti/segreteria-di-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.
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 classroom 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 doesn't have 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 - https://cla.unipv.it/

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 partly contribute to the mobility costs. The most important innovation is that students can benefit from available scholarships for both their exams and their traineeship (Undergraduate and Masters' Degree).

Incoming students

The University of Pavia welcomes about 350 Erasmus students each year, and has more than 700 Erasmus agreements with European Universities. We look forward to welcoming you as an exchange student at our University! On these websites you can find the necessary information on the application process as well as studying and living at the University of Pavia.
For information, please visit http://wcm-3.unipv.it/site/en/home/international-relations/erasmus/incoming-students.html

Erasmus Traineeship

Erasmus traineeship is a new EU programme within the Erasmus + scheme. It enables students at higher education institutions to do a work placement (traineeship/internship) in an enterprise or organisation in another participating country.
The training period lasts between 2 and 12 months. The training period has to end by 30th September.
For information, please visit http://wcm-3.unipv.it/site/en/home/international-relations/erasmus/erasmus-traineeship.html

Erasmus Deputy:
prof. Elisa Sacchi
E-mail elisa.sacchi@unipv.it

FIELD TRIPS

Our 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 2018/19 field trips, as an example of our program activities.

The meaning of a disaster: Vajont field course Vajont **Landslides Hazard and Risks**
Landslide monitoring Oltrepò Pavese **Landslides Hazard and Risks**
Geomorphology of Staffora river Oltrepò Pavese (Pavia) **Geomorfologia applicata e impatti ambientali**
Mantle in ophiolite sequences Lanzo Torinese (Torino) **Composizione della litosfera**
Ophilites in inner Liguria units Rocchetta di Vara (La Spezia) **Composizione della litosfera**
Ophiolites in outer Liguria units Val Perino (Piacenza) **Composizione della litosfera**
Lower continental crust sequences in the Ivrea-Verbano zone Val Sesia (Vercelli) **Composizione della litosfera**
Visit to Boario Terme Val Camonica (Brescia) **Idrogeologia applicata**.
Permo-Triassic basins in Dolomites Val di Fassa **Basin Analysis**
Visit to ERSF syncrotrone Switzerland **Analytical Methodologies applied to Geosciences**
Visit to LENA (Applied Nuclear Energy Lab) Pavia **Environmental Geochemistry**
Visit to water treatment station Pavia **Environmental Geochemistry**
Geopedology of Canton Ticino Canton Ticino (Switzerland) **Geopedology**
Idrogeological surveys in Val Camonica, Valle del Dezzo, Valle del Trobiolo and visit to Boario thermal station Boario Terme (Brescia) **Idrogeologia Applicata**
Visit to MUSE (Natural History and Science Museum) Trento **Didattica delle Geoscienze**
Geomorphology and geodiversity Pavia **Didattica delle Geoscienze**
Field trip in the Alps Central Alps **Seismic interpretation for geological modelling**

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 the university of Pavia. Faculties or departments run the computer rooms, and each of them has their own rules for access and opening times. For more information: https://laboratori.unipv.it/
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 name and password, given by the university when you enroll.

Libraries
Students are 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 visit the following website:
http://libraries.unipv.it/
To consult the OPAC, please visit:
http://opac.unipv.it

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 Foreign Languages 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.They are also open to anyone who is interested in learning Italian.

EARTH AND ENVIRONMENTAL SCIENCES PhD

The PhD represents the highest level in University education.
To be admitted to a PhD Program you must apply to an official call, published generally in May.
The Ph.D. is a three academic years program and it ends with an exam in which the candidate presents an original research.
The Ph.D. is aimed not only at giving an advanced preparation, but also to teach young researcher to become autonomous and confident.

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

Our PhD program 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 projects.

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).