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DIPARTIMENTO
DI FISICA E GEOLOGIA
DIPARTIMENTO DI ECCELLENZA
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University of Perugia
Department of Physics and Geology

<http://www.fisica.unipg.it/fisgejo/index.php/it/>

Master of Science in Geology for Energy Resources (GER)

Aim of the Course

The MSc in Geology for Energy Resources (GER) addresses the evolving energy sector by training geoscientists to integrate traditional geological expertise with innovative methods for sustainable energy exploration and production. This two-year multidisciplinary program covers Earth Sciences applications in fields such as hydrocarbon exploration, geothermal energy, CO₂ storage, and environmental recovery.

Students gain in-depth knowledge of geology, sedimentary processes, geophysics, and modern exploration techniques like basin analysis, sequence stratigraphy, and seismic interpretation. The course prepares professionals for careers in energy companies, consulting industries, research, and public institutions, emphasizing technical expertise, problem-solving, communication, and lifelong learning.

Fieldwork is a vital component of the training, allowing students to apply classroom concepts in real-world settings. These field trips are conducted in geologically significant areas, providing hands-on experience and enhancing understanding of surface and subsurface geological reconstructions using advanced techniques.

The course has been structured in close collaboration with Eni-ECU (Eni Corporate University). During the two-years course of study, experts from Eni, as well as from other commercial and public companies, will supply seminars and practical courses on topics strictly related to the industrial applications of geology.

Outline of the MSc in Geology for Energy Resources

The normal extent for obtaining the Master's degree is two years. To achieve the final title, the student must have acquired 120 credits (CFU). Each credit corresponds to 25 hours of student work. For each training credit, considering the different variable commitment (personal study) required, the corresponding number of hours is determined as follow:

Frontal lectures	7 hours
Practice in the classroom or lab	12 hours
Internships, preparation of the final Project and written Thesis	25 hours

The two-year program (2024-2025) is structured into four semesters, with the final semester dedicated to the Master's Thesis (24 CFU). Students may complete their thesis at the Department of Physics and Geology, in collaboration with industries, research centers, or participate in the Erasmus Program at foreign universities. The thesis must be defended at the University of Perugia under the guidance of at least one tutor from the Perugia teaching staff.

Academic Calendar - LM Geology for Energy Resources

First Year

<i>Type of activity</i>	<i>Course</i>	<i>Credits (CFU)</i>
1st semester (September - December)		
Fundamental to choose between the two	GIS (Geographical Information Systems)	6
	Mathematical Methods for Geosciences	6
Fundamental	Sedimentary Geology	9
Fundamental	Exploration and Applied Geophysics	9
Fundamental	Global Tectonics and Global Changes	6
2nd semester (February - May)		
Fundamental	Seismic interpretation and digital modelling	9
Fundamental	Structural Geology	6
Fundamental	Applied Geochemistry and Fluid rock interaction	6
Fundamental	Integrated Stratigraphy	6
Student option	1 optional course, chosen by the student during the first or second semester	6
Supplementary educational activity	Geological Field Trips	3

Second Year

<i>Type of activity</i>	<i>Course</i>	<i>Credits (CFU)</i>
1st semester (September - December)		
Fundamental	Petrophysics and Well Log interpretation - including 1 Eni seminar	6
Fundamental to choose between the two	Geothermics	6
	Fluids storage for energy transition	6
Fundamental to choose between the two	Environmental Geology	6
	Applied Mineralogy	6
Fundamental to choose between the two	Applied Biostratigraphy	6
	Applied Hydrogeology	6
Student option	1 optional course, chosen by the student during the first or second semester	6

Final Thesis: 24 CFU

Optional courses: students can choose as optional from all the courses offered by the University of Perugia. The optional courses given in English, offered by the Department of Physics and Geology are:

<i>Optional courses held in English</i>	<i>Semester</i>	<i>CFU</i>
Sedimentary Petrography	first semester	6
Reservoir Geology	End of the first semester of the II year	6
Ore deposits and sustainable Mining	second semester	6
Earth System Science	first semester	6
Environmental Geochemistry	second semester	6

The optional courses given in Italian, offered by the Department of Physics and Geology are:

<i>Optional courses held in Italian</i>	<i>Semester</i>	<i>CFU</i>
Paleontologia dei Vertebrati	second semester	6
Geologia dei Terremoti e Rischio sismico	first semester	6
Rilevamento geologico-tecnico e monitoraggio	first semester	6
Chimica Ambientale	first semester	6
Geomatematica	first semester	6

It is recommended to complete the study plan immediately after enrollment procedure, at the beginning of the first semester.

Calendar of the teaching activities and exams

<i>Semester</i>	<i>Lectures</i>	<i>Period of exams</i>	<i>Sessions</i>
1 st	from 23/09/2024 to 11/01/2025	from 20/11/2024 to 24/11/2024	1
		from 15/01/2025 to 23/02/2025	2
2 st	from 24/02/2025 to 31/05/2025	from 25/03/2025 to 29/04/2025	1
		from 03/06/2025 to 31/07/2025	2
		from 02/09/2025 to 20/09/2025	2

Teaching methods and Assessment

The course is entirely delivered in English, and therefore it is required a properly certified knowledge of English language corresponding to the European **level B2** or equivalent.

The training activities will be performed with different modalities, such as frontal lectures, practical work (in classroom and laboratory), seminars, training courses, individual and assisted studies, field works.

The practical activities intend to develop the student's ability to solve efficiently problems, to work independently, and to develop skills in team-working and data sharing. Exercises will allow the teacher to verify the learning level of each student. To improve students' skills, seminars and meetings with experts will be organized each year.

Lecture attendance is strongly recommended for all courses; attendance at scheduled seminars and fieldwork is mandatory. The credits are acquired after positive assessment of profit (exams). Evaluations have individual character and may consist of written and/or oral and/or exercise to be performed in laboratory or in the field. All activities allowing acquisition of credit must be assessed. The evaluation of the students is made by a specific committee, consisting of at least two teachers. The mark is expressed in thirties. The composition of the committees and the calendar of exams are published on the website at the beginning of each academic year.

Pre-Requisites

Curricular pre-requisites are:

- Bachelor's degree, preferably in Geology, or in topics related to Earth Sciences.
- Basic training in mathematics, physics and chemistry.
- Bachelor's degree (translated in English or Italian).
- Transcript (in English, any format).
- English proficiency certificate for non-English mother tongue.

The enrollment application must be submitted exclusively through the **University platform** (www.university.it).

Applications must be sent to Dipartimento di Fisica e Geologia, Via Pascoli, 06123 - Perugia (Italy) by email to: segr-didattica.fisgeo@unipg.it

Applications will be evaluated by a committee of the Department of Physics and Geology.

Transfers

Procedures and criteria for the recognition of credits acquired in other courses of study.

Credit recognition requests are reviewed by a committee based on established criteria. Credits from programs of the same class are fully recognized, while those from different classes are evaluated for compatibility with the Master's objectives, with a maximum of 12 CFU recognized.

International credits under bilateral agreements follow the ECTS system. Credits from other institutions are assessed based on the documentation provided. Agreements between the University of Perugia and the originating institution will guide the recognition process. The committee and course advisor assist students in creating individual study plans.

Final exam

After exams, students complete an independent thesis to demonstrate their ability to conduct original research, apply critical analysis, and manage technical and time-related aspects. The thesis is supervised by a faculty member, with optional co-supervisors who are experts in the topic. The co-supervisor must be expert in the topic of the thesis and not necessarily belonging to an academic staff.

The thesis, written in English (with an Italian abstract) or Italian (with an English abstract), is defended before a seven-member committee, including the supervisor. Evaluation considers thesis quality, presentation, and the student's overall academic performance. Up to 10 points may be added to the weighted exam average, and unanimous approval grants honors (110 cum laude).

Tutoring

The tutorial activities are organized and managed by the Director of the Geological Courses.

The tutors for the Academic Year 2024/2025 will be Profs. Massimiliano Porreca, Giorgio Minelli and Amalia Spina. The advisor of the Master Course is Prof. Massimiliano Porreca.

Minimum language requirements for the admission

English B2 Level

A B2-level English language certification must be submitted via the University platform during the application process to assess eligibility for enrollment.

DIRECTOR OF THE GEOLOGICAL COURSES
Prof. Corrado Cencetti