



Master in Geology

The 2024-2025 programme is subject to change. It is provided for information purposes only.

Programme mnemonic

MA-GEOL

> Focus *Research - 1st year*: M-GEOLA

Studies level

Master 120 credits

Learning language

french

Schedule

office hours

Studies category / subcategory

Sciences and technics / Sciences

Campus

Plaine and Solbosch

Programme's added value

The Master in Geology is based on contributions from recognised experts in the fields of volcanology; isotope geochemistry and cosmochemistry; environmental (bio)geochemistry; chemical oceanography; sedimentology and biogeology; global modelling of the Earth system; GIS. In addition, experts from the Royal Institute of Natural Sciences of Belgium, the Royal Museum for Central Africa (RMCA), and the Royal Observatory of Belgium, and VUB, take an active part in teaching activities, as part of the 'Pole Géosciences de Bruxelles'.

The teaching program offers students the opportunity to perform a field trip abroad (where the student will be immersed in his role as field geologist); a research trip on the Belgica; and an internship (long or short) that will inform the student on future professional careers. In addition, there is a wide range of optional courses on offer; opportunities to work in group; to give oral presentations and to master both languages (French and English).

Programme objectives

Today, more than ever, geologists are **geoscientists**. Their multi-disciplinary background in earth and environmental sciences allows them to tackle complex issues associated with the evolution of our Planet, and the interactions between Humans and the Environment. They are, and will be in the future, key players in the sustainable development of our societies.

In addition to providing solid training on the theoretical, practical, analytical and modelling tools necessary for a modern geologist, our Master in Geology gives students the opportunity to choose amongst a large range of in-depth specialisations (related to geochemistry, geology and environment). Our curriculum guarantees strong professional skills that could lead the students to scientific research, but also to careers in the private sector, e.g. in environmental consulting, management of natural resources, assessment of natural hazards, or exploration and exploitation of geomaterials.

Teaching methods

The teaching methods follow the objectives set by the competency framework of the Faculty and the Master in Geology.

The Advanced Master program offers a series of mandatory courses (in Volcanology, Geochemistry, Geochronology, Metallogeny, Cosmochemistry and Planetology, Structural Geology, Hydrogeology, Oceanography, Environmental Geochemistry, and Modeling of the Earth System and Climate Change, Geographic Information Systems (GIS) to be followed over the two years of the Master.

These courses are accompanied by a fieldtrip abroad organized as part of the curriculum, a trip on the research vessel Belgica, and optional courses to be chosen among a very wide range of topics related to the Environment, Climate, Glaciology, Dynamics of the Atmosphere, ...

The entire curriculum therefore relies on a strong geochemical focus applied to both the Inner Earth and its surface reservoirs and their interactions. Special attention is given to field observations, laboratory analyses and measurements, and modeling.



A Master thesis will be produced in block 2 at the ULB and / or in collaboration with a partner institution.

An internship of 1 to 3 months must be undertaken during the Master (value: 10 or 20 credits depending on the length of the internship). This internship provides the student with the opportunity to become familiar with a new research environment and / or professional life by creating direct contacts within a company.

Succeed in your studies

Choose

The information and guidance counsellors at the InfOR-études [<https://www.ulb.be/en/studies-info-desk-1>] service will help you choose your studies throughout the year.

Succeed

Take part in preparatory courses [<https://www.ulb.be/en/studies-info-desk-1>] or get help to succeed [<https://www.ulb.be/en/studies-info-desk-1>], before or during your studies.

Get help

Apply for financial aid, look for accommodation or a student job, get support [<https://www.ulb.be/fr/aides-services-et-accompagnement/aid-services-and-support-1>] for your specific needs.

International/Openness

Student apply to go on an Erasmus exchange period or a work placement in another university, whether a close ULB partner or a member of an international networks that ULB is part of.

Strong collaborations with the Royal Museum for Central Africa (MRAC), Royal Observatory of Belgium and Royal Belgian Institute of Natural Sciences.

Job opportunities

The geologist intervenes in challenges at the scale of the municipality, the country or even the planet. His high-level training can lead him to research in the academic sector but also in the private sector. Significant opportunities also exist in the public and non-governmental sectors, in with the context of management of natural hazards, land-use planning or the sustainable management of the environment and natural resources (environmental consultancy, soil remediation, protection of groundwater, air quality analysis ...). The technical skills acquired are also highly appreciated by the industries active in the field of geomaterials (civil engineering, cement, sustainable architecture, hydrogeology, mining exploration, ...). With his knowledge, the geologist trained at the ULB will be called upon to play a central role in the major challenge of the 21st century: sustainable development of our planet-friendly society.

Contacts

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 <https://sciences.ulb.be/departement-geosciences-environnement-et-societe>

Jury President

Vinciane DEBAILLE

Jury Secretary

Sandra ARNDT



Master in Geology

Focus Research - 1st year

Bloc 1 | M-GEOLA | MA-GEOL

Cours obligatoires

- GEOL-F4002 **Volcanology** | Karen FONTIJN (Coordinator) and Corentin CAUDRON
 5 credits [lecture: 24h, tutorial classes: 8h, practical work: 8h, project: 30h] second term English
- GEOL-F4003 **Origine de la vie et son évolution sur Terre** | Steeve BONNEVILLE (Coordinator)
 5 credits [lecture: 36h] first term French
- GEOL-F408 **Volcanic Terrains Field Trip** | Karen FONTIJN (Coordinator)
 5 credits [field trips: 60h] second term English
- GEOL-F411 **Géochimie élémentaire et isotopique** | Vinciane DEBAILLE (Coordinator)
 5 credits [lecture: 30h, practical work: 15h] first term French
- GEOL-F412 **Applied Geochemical Dynamics** | Corentin CAUDRON (Coordinator) and Vinciane DEBAILLE
 5 credits [lecture: 26h, practical work: 20h] second term French
- GEOL-F414 **Éléments d'hydrogéologie** | Philippe Orban (Coordinator) and Pascal Goderniaux
 5 credits [lecture: 24h, practical work: 24h, field trips: 12h] first term French
- GEOL-F427 **Géologie structurale** | Sara VANDYCKE (Coordinator)
 5 credits [lecture: 24h, field trips: 24h, project: 12h] first term French
- GEOL-F428 **Earth System Modeling** | Pierre REGNIER (Coordinator) and Sandra ARNDT
 5 credits [lecture: 24h, practical work: 24h] first term French
- GEOL-F436 **The Global Coastal Ocean on a Changing Planet** | Sandra ARNDT (Coordinator) and Pierre REGNIER
 5 credits [lecture: 12h, practical work: 24h, field trips: 24h] second term French

Cours optionnels

A total of 15 credits chosen from the following

- BIOL-F4002 (optional) **Pédologie et écosystèmes** | Thomas DROUET DE LA THIBAUDERIE (Coordinator)
 5 credits [lecture: 36h] first term French
- CHIM-F102 (optional) **Chimie organique 1** | Cécile MOUCHERON (Coordinator)
 5 credits [lecture: 30h, tutorial classes: 18h] second term French
- CHIM-F405 (optional) **Photophysique des atmosphères et des milieux interstellaires** | Nathalie VAECK (Coordinator), Sophie Bauduin and Lieven CLARISSE
 5 credits [lecture: 36h, project: 12h] second term English/French
- CHIM-H302 (optional) **Pollution du milieu physique** | Michel VERBANCK (Coordinator) and Gilles BRUYLANTS
 5 credits [lecture: 40h, tutorial classes: 8h, practical work: 12h] second term French
- ENVI-F405 (optional) **Climat: sciences et politiques** | Frank PATTYN (Coordinator)
 5 credits [lecture: 40h] second term French
- ENVI-F432 (optional) **Cycles biogéochimiques globaux : processus, quantification, attribution** | Steeve BONNEVILLE (Coordinator), Goulven Gildas LARUELLE and Pierre REGNIER
 5 credits [lecture: 30h] second term French

ENVI-F451 (optional)	<p>Téledétection des variables climatiques et environnementales Pierre-François COHEUR (Coordinator), Sophie Bauduin and Lieven CLARISSE</p> <p>🕒 5 credits [lecture: 36h, practical work: 12h, project: 28h] 📅 second term 🗨 English/French</p>
ENVI-F526 (optional)	<p>Sciences de l'atmosphère et changements climatiques Pierre-François COHEUR (Coordinator) and Cathy CLERBAUX</p> <p>🕒 5 credits [lecture: 36h, project: 24h] 📅 second term 🗨 French</p>
ENVI-F527 (optional)	<p>Matière et énergie dans l'environnement: analyse, transport et instabilités François FRIPIAT (Coordinator) and Anne DE WIT</p> <p>🕒 5 credits [lecture: 36h, practical work: 24h] 📅 second term 🗨 French</p>
GEOG-F211 (optional)	<p>Systèmes d'information géographique et projections Eléonore WOLFF (Coordinator) and Michele D'ADDERIO</p> <p>🕒 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 French</p>
GEOG-F400 (optional)	<p>The Earth system and its interactions François FRIPIAT (Coordinator)</p> <p>🕒 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English</p>
GEOG-F408 (optional)	<p>Modélisation en géosciences : glaciologie et climatologie Frank PATTYN (Coordinator)</p> <p>🕒 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 French</p>
GEOG-F410 (optional)	<p>Paléoclimatologie François FRIPIAT (Coordinator)</p> <p>🕒 5 credits [lecture: 36h, practical work: 12h] 📅 second term 🗨 French</p>
GEOG-F425 (optional)	<p>Téledétection Eléonore WOLFF (Coordinator)</p> <p>🕒 5 credits [lecture: 30h, practical work: 30h] 📅 first term 🗨 French</p>
GEOL-F4004 (optional)	<p>Cosmoschimie et planétologie Vinciane DEBAILLE (Coordinator) and Alain JORISSEN</p> <p>🕒 5 credits [lecture: 36h] 📅 first term</p> <p>Ce cours est donné un an sur deux.</p>
GEOL-F408 (optional)	<p>Volcanic Terrains Field Trip Karen FONTIJN (Coordinator)</p> <p>🕒 5 credits [field trips: 60h] 📅 second term 🗨 English</p>



Master in Geology

Focus Research - 1st year

Bloc 2 | M-GEOLA | MA-GEOL

Cours obligatoires

MEMO-F519 **Mémoire** | Nadine MATTIELLI (Coordinator)
 25 credits [mfe/tfe: 300h] first and second terms

Dans le cadre de la mobilité et du mémoire, l'étudiant peut être amené à suivre des cours ou à réaliser des analyses dans des laboratoires d'universités partenaires (voir liste ERASMUS).

One course chosen from the following

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GEOL-F528 (optional) **Mobilité** | Nadine MATTIELLI (Coordinator)
 10 credits [personal assignments: 120h] first and second terms French

GEOL-F528 (optional) **Mobilité** | Nadine MATTIELLI (Coordinator)
 20 credits [personal assignments: 360h] academic year French

Cours optionnels

15 to 25 credits chosen from the following

BIOL-F4002 (optional) **Pédologie et écosystèmes** | Thomas DROUET DE LA THIBAUDERIE (Coordinator)
 5 credits [lecture: 36h] first term French

CHIM-F102 (optional) **Chimie organique 1** | Cécile MOUCHERON (Coordinator)
 5 credits [lecture: 30h, tutorial classes: 18h] second term French

CHIM-F405 (optional) **Photophysique des atmosphères et des milieux interstellaires** | Nathalie VAECK (Coordinator), Sophie Bauduin and Lieven CLARISSE
 5 credits [lecture: 36h, project: 12h] second term English/French

CHIM-H302 (optional) **Pollution du milieu physique** | Michel VERBANCK (Coordinator) and Gilles BRUYLANTS
 5 credits [lecture: 40h, tutorial classes: 8h, practical work: 12h] second term French

ENVI-F405 (optional) **Climat: sciences et politiques** | Frank PATTYN (Coordinator)
 5 credits [lecture: 40h] second term French

ENVI-F432 (optional) **Cycles biogéochimiques globaux : processus, quantification, attribution** | Steeve BONNEVILLE (Coordinator), Goulven Gildas LARUELLE and Pierre REGNIER
 5 credits [lecture: 30h] second term French

ENVI-F451 (optional) **Télé-détection des variables climatiques et environnementales** | Pierre-François COHEUR (Coordinator), Sophie Bauduin and Lieven CLARISSE
 5 credits [lecture: 36h, practical work: 12h, project: 28h] second term English/French

ENVI-F455 <small>(optional)</small>	Géoressources du sous-sol et anthropocène Corentin CAUDRON, Adel EL Gammal and Nadine MATTIELLI ⌚ 5 credits [lecture: 34h, seminars: 10h, field trips: 16h] 📅 second term 🗨 French
ENVI-F526 <small>(optional)</small>	Sciences de l'atmosphère et changements climatiques Pierre-François COHEUR (Coordinator) and Cathy CLERBAUX ⌚ 5 credits [lecture: 36h, project: 24h] 📅 second term 🗨 French
ENVI-F527 <small>(optional)</small>	Matière et énergie dans l'environnement: analyse, transport et instabilités François FRIPIAT (Coordinator) and Anne DE WIT ⌚ 5 credits [lecture: 36h, practical work: 24h] 📅 second term 🗨 French
GEOG-F103 <small>(optional)</small>	Fondements de la géographie humaine Jean-Michel DECROLY (Coordinator) ⌚ 5 credits [lecture: 36h, project: 20h] 📅 second term 🗨 French
GEOG-F211 <small>(optional)</small>	Systèmes d'information géographique et projections Eléonore WOLFF (Coordinator) and Michele D'ADDERIO ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 French
GEOG-F313 <small>(optional)</small>	Géographie régionale Jean-Michel DECROLY (Coordinator), Gilles VAN HAMME and Eléonore WOLFF ⌚ 5 credits [lecture: 48h, practical work: 12h, project: 80h] 📅 first and second terms 🗨 French
GEOG-F400 <small>(optional)</small>	The Earth system and its interactions François FRIPIAT (Coordinator) ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 first term 🗨 English
GEOG-F408 <small>(optional)</small>	Modélisation en géosciences : glaciologie et climatologie Frank PATTYN (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 French
GEOG-F410 <small>(optional)</small>	Paléoclimatologie François FRIPIAT (Coordinator) ⌚ 5 credits [lecture: 36h, practical work: 12h] 📅 second term 🗨 French
GEOG-F414 <small>(optional)</small>	Analyse des espaces urbains Mathieu VAN CRIEKINGEN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 6h, project: 30h] 📅 first term 🗨 French
GEOG-F425 <small>(optional)</small>	Téledétection Eléonore WOLFF (Coordinator) ⌚ 5 credits [lecture: 30h, practical work: 30h] 📅 first term 🗨 French
GEOL-F4004 <small>(optional)</small>	Cosmoschimie et planétologie Vinciane DEBAILLE (Coordinator) and Alain JORISSEN ⌚ 5 credits [lecture: 36h] 📅 first term Ce cours est donné un an sur deux.
GEOL-F438 <small>(optional)</small>	Géochimie isotopique de l'environnement : Concepts, applications, et méthodes Nadine MATTIELLI (Coordinator), François FRIPIAT and Steven Goderis ⌚ 5 credits [lecture: 24h, practical work: 16h] 📅 second term 🗨 French

