



# Bachelor in Geology

## Programme mnemonic

BA-GEOL

## Studies level

Bachelor

## Learning language

french

## Schedule

office hours

## Studies category / subcategory

Sciences and technics / Sciences

## Campus

Solbosch

of Belgium, the Royal Museum of Central Africa and the Royal Observatory of Belgium, as well as with a number of European institutions in the framework of the Erasmus-Socrates programme.

Our research assistants will give individual guidance to small groups of students.

You have at your disposal:

- a specialized departmental library.
- a microscopy room
- a computer room
- research materials for the supervised practical training (XRD, electronic microscopy ...).

## Teaching methods

In addition to the basic courses in physics, chemistry, mathematics and biology, geology courses are taught in the first block and are accompanied by practical training based on the recognition of rocks and fossils. These achievements are complemented with a one-day field trip, which links the materials learned in the laboratory with the observations from outcrops throughout geological time. This first year programme makes students more aware of spatio-temporal scales encountered in geology; it shows them also that the present-day is a key to the study of the past. It also provides a first glimpse of the overall functioning of our planet, since the formation of the solar system to the way it is now perturbed by human activities. The blocks 2 and 3 of the Bachelor programme seek to strengthen the theoretical geology courses and modeling, practical training together with their illustration in the field. Studies of field mapping, sedimentology, hydrology, geophysics ... show how geological analysis is diverse and based on a qualitative analysis on which are grafted, from the field observations, many measurements (compass, gamma-ray, resistivity ...) in order to quantify the processes taking place. Near the end of the bachelor programme, a field training of a 15-day period enable the students to make a geological map of the region themselves. This allows them to develop or utilize the knowledge acquired earlier and constitutes their first major personal work. Several practical training sessions under the supervision of a teaching assistant are then devoted to the establishment of the report of the field training course and to the completion of the geological map from the data collected. More theoretical courses such as mineralogy, igneous/metamorphic/sedimentary

## Programme objectives

Fulfill your ambitions by gaining a training in an extremely diverse range of fields, including

- Management and use of the sub-soil environments (water, raw materials, fossil fuels).
- Global environmental management (climate change, protection of water resources, natural risks – volcanic eruptions, earthquakes, landslides ...).
- Geological mapping.

## Programme's added value

The training of geologists is versatile in nature. It is based on combined teaching of several subjects such as **geology, chemistry and biology**. The student will be able to develop skills in all sub-disciplines of geological sciences, particularly in petrography and mineralogy, paleontology, geobiology and biogeochemistry, sedimentology and (paleo)climatology, geophysics, volcanology and oceanography.

Through these themes, geologists trained at ULB will be apt to work in all regions of the globe. They are quickly hired in Belgium, but also in regions as diverse as Africa, Australia or New Caledonia.

The Department of Earth and Environmental Sciences at ULB maintains close ties with the Royal Institute of Natural Sciences



petrology, volcanology, metallurgy, and thermodynamic modeling of processes at the sediment/water and hydrosphere/biosphere/atmosphere interfaces, allow the students to integrate field data (drawing a geological map) in global contexts. This pedagogy in the acquisition of knowledge familiarizes the students with the uniqueness of the geological processes that operate at the local scale, but far beyond.

## 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

Our Department of Earth and Environmental Sciences has developed Erasmus-Socrates programmes with a number of European institutions. These programmes give you the possibility to spend four or eight months at a foreign university.

Many "visiting" professors teach in our bachelor programme and bring their expertise in their respective fields, both in the form of lectures, practical training and field trips. For over 10 years, a close ongoing collaboration has emerged in the field of geology between the Universities of Namur, Mons, Lille and various scientific institutes (Royal Observatory of Belgium in Uccle, Royal Museum of Central Africa in Tervuren, Institute of Natural Sciences in Brussels ..). These partnerships also apply to the Master programme and students have especially the opportunity to conduct their Master's thesis in these institutions that they have discovered during their study of the bachelor's degree.

## Job opportunities

If you go on to do a Master in Geology, you will be able to work in a wide range of sectors, some of which you would never have thought of going into:

- > Geological and mining exploration, often abroad, for companies or official bodies.
- > Oil sector, in a laboratory or working on the ground.
- > Hydrology, research into and development of water resources.
- > Research and teaching.
- > Monitoring of seismic and volcanic zones.

- > Management of radioactive waste storage.
- > Renewable energies (geothermal).
- > Other openings in related fields: geotechnics (civil engineering), resource planning and development, combating pollution.

Thanks to the analytical side of the programme, other fields will be open to you, including construction materials, glass and ceramics, monument restoration, waste water treatment, occupational illnesses caused by minerals.

You can also go into research in the following areas: volcanology, oceanography, environmental geochemistry, geophysics, hydrogeology. At the end of your study, and if you decide to opt for other master's courses, you could specialise in areas such as environmental management.

Very diverse both in the academic and applied fields. In the academic field, education (academic or not), researcher in national and international scientific institutions in all types of areas (paleontology, seismology, modeling, planetary science, volcanology, natural hazards, experimentation of materials, weathering of stones and monuments, polluted sites ...) and in applied georesources (hydrology, fossil fuels, renewable energy, metallurgy, gemology ...), extractive resources of geomaterials (gravels, sands, limestones, marbles, pozzolans ...), environment (remediation, pollution of soil, groundwater, aerosols, carbon sequestration,...), geotechnology (study of the foundation for dam constructions, transportation routes, building various constructions..)

The geologists are very versatile, from their 'first' job as cartographer till that of modeling of past and present biogeochemical cycles through a multitude of trades such as prospector of gold, diamond... Geologists have a crucial place in crude oil exploration; they are also geochemist analyzing gases from the Earth, or biogeochemist searching biosignature for exobiology purpose .... This versatility leads to puridisciplinarity with, for example, physicists for processing and interpreting seismic profiles, with biologists for searching for traces of life, with bioengineers and agronomists for making better usage of the soils, with chemists for characterizing the atmospheres of the past or soil and groundwater pollution ....

### Contacts

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

### Jury President

Steeve BONNEVILLE

### Jury Secretary

Goulven Gildas LARUELLE



# Bachelor in Geology

The program consists of 1/3 of lectures on theory and modeling, 1/3 of practical training in the laboratory and 1/3 of fieldwork. It will allow one to **study the major phenomena related to geology**, from plate tectonics to interactions between geosphere, hydrosphere, atmosphere and biosphere. The techniques implemented cover all tools of the geologist, such as geological mapping, field sampling and laboratory analysis or global modeling of the functioning of our planet. An important component of the curriculum is also dedicated to geo-materials in its microscopic as well as macroscopic organization.

The lectures are accompanied by practical work conducted in the laboratory. They will help acquire specialized training in modern analytical methods in areas such as **geochemistry, optical and electron microscopy, crystallography, petrography of the rocks and computer modeling**.

After his/her BA, if he/she wishes to move towards other MA, the student can orient himself/herself in areas such as geophysics, coastal planning, environmental management and hydrogeology. The student can also be directed towards research in volcanology, oceanography and environmental geochemistry.

## Bloc 1 | BA-GEOL























### Cours obligatoires

BIOL-F102	<b>Biologie générale</b>   Patrick MARDULYN (Coordinator) and Etienne MEYLAN ⌚ 5 credits [lecture: 48h] 📅 second term 🗨 French
CHIM-F101	<b>Chimie générale</b>   Laurence RONGY (Coordinator), François RENIERS and Thierry VISART DE BOCARME ⌚ 20 credits [lecture: 96h, tutorial classes: 60h, practical work: 84h, project: 75h] 📅 first and second terms 🗨 French
ENVI-F1001	<b>Sciences de la Terre, Environnement et Société</b>   Pierre REGNIER (Coordinator), Jean-Michel DECROLY and Frank PATTYN ⌚ 5 credits [lecture: 48h, field trips: 12h] 📅 first and second terms 🗨 French
GEOL-F104	<b>Les temps géologiques : concepts et méthodes</b>   Sandra ARNDT (Coordinator) and Goulven Gildas LARUELLE ⌚ 5 credits [lecture: 24h, practical work: 36h] 📅 second term 🗨 French
GEOL-F105	<b>Géologie de l'Europe</b>   Vinciane DEBAILLE (Coordinator) and Steeve BONNEVILLE ⌚ 5 credits [lecture: 16h, field trips: 24h] 📅 second term
MATH-F112	<b>Mathématiques 1</b>   Dimitri LEEMANS (Coordinator), Michele D'ADDERIO and Bruno PREMOSELLI ⌚ 10 credits [lecture: 60h, tutorial classes: 60h] 📅 first and second terms 🗨 French
PHYS-F104	<b>Physique 1</b>   Barbara CLERBAUX (Coordinator), Sébastien CLESSE and Michele SFERRAZZA ⌚ 10 credits [lecture: 72h, tutorial classes: 36h] 📅 first and second terms 🗨 French

# Bachelor in Geology

## Bloc 2 | BA-GEOL

### Cours obligatoires

BIOL-F201	<b>Evolution et diversité des eucaryotes : botanique</b>   Pierre Jacques MEERTS (Coordinator) and Jason VLEMINCKX 5 credits [lecture: 42h, practical work: 12h]  first and second terms  French
GEOG-F102	<b>Géomorphologie tectonique</b>   Frank PATTYN (Coordinator) 5 credits [lecture: 20h, practical work: 24h, field trips: 8h, project: 10h]  second term  French
GEOL-F2001	<b>Introduction à la minéralogie et à la pédologie</b>   Steeve BONNEVILLE (Coordinator) and Thomas DROUET DE LA THIBAUDERIE 5 credits [lecture: 28h, practical work: 12h, field trips: 12h]  first term  French
GEOL-F202	<b>Eléments de cartographie géologique et de géologie structurale</b>   Sandra ARNDT (Coordinator) 5 credits [lecture: 12h, practical work: 24h, field trips: 16h]  first term  French
GEOL-F204	<b>Sédimentologie</b>   Xavier DEVLEESCHOUWER (Coordinator) 5 credits [lecture: 24h, practical work: 12h, field trips: 24h]  second term  French
GEOL-F211	<b>Introduction à la pétrologie</b>   Nadine MATTIELLI (Coordinator) 5 credits [lecture: 12h, practical work: 36h, field trips: 16h]  second term  French
GEOL-F301	<b>Minéralogie</b>   Karen FONTIJN (Coordinator) 5 credits [lecture: 24h, practical work: 36h]  first term  French
INFO-F206	<b>Informatique</b>   Olivier MARKOWITCH (Coordinator) 5 credits [lecture: 24h, tutorial classes: 12h, project: 24h]  first term  French
LANG-F201	<b>Anglais scientifique I</b>   Alexander CORNFORD (Coordinator), David Albert BEST and Hugh MURPHY 5 credits [tutorial classes: 48h]  second term  English
MATH-F115	<b>Compléments d'analyse et algèbre linéaire</b>   Joel FINE (Coordinator), Michele D'ADDARIO and Laurent LA FUENTE-GRAVY 5 credits [lecture: 30h, tutorial classes: 24h]  second term  French
PHYS-F205	<b>Physique 2</b>   Michel TYTGAT (Coordinator) and Michele SFERRAZZA 5 credits [lecture: 24h, tutorial classes: 14h, practical work: 22h]  first term  French

### Cours optionnels

*A total of five credits chosen from the following*

CHIM-F201 (optional)	<b>Chimie analytique 1</b>   Thomas DONEUX (Coordinator) 5 credits [lecture: 24h, practical work: 36h]  first term  French
ETHI-F201 (optional)	<b>Sciences, éthique, histoire et société</b>   Grégoire Wallenborn (Coordinator) and Eric MURAILLE 5 credits [lecture: 48h]  second term  French
ETHI-F301 (optional)	<b>Science et Société : analyse de controverses scientifiques</b>   Patrick MARDULYN (Coordinator) and Grégoire Wallenborn 5 credits [lecture: 24h, project: 70h]  first term  French
GEOG-F103 (optional)	<b>Fondements de la géographie humaine</b>   Jean-Michel DECROLY (Coordinator) 5 credits [lecture: 36h, project: 20h]  second term  French

GEOG-F203 (optional)	<a href="#">Climatologie et géomorphologie glaciaire</a>   Frank PATTYN (Coordinator) ⌚ 5 credits [lecture: 24h, practical work: 24h, project: 10h] 📅 second term 🗨 French
GEOG-F210 (optional)	<a href="#">Géographie de l'Europe</a>   Gilles VAN HAMME (Coordinator) ⌚ 5 credits [lecture: 24h] 📅 second term 🗨 French
GEOG-S101 (optional)	<a href="#">Géographie économique</a>   Gilles VAN HAMME (Coordinator) ⌚ 5 credits [lecture: 48h] 📅 second term 🗨 French
PHYS-F105 (optional)	<a href="#">La structure de l'univers</a>   Alain JORISSEN (Coordinator) and Rodrigo ALVAREZ ⌚ 5 credits [lecture: 48h] 📅 first term 🗨 French
TRAN-F201 (optional)	<a href="#">Introduction aux enjeux de la durabilité</a>   Wouter ACHTEN (Coordinator) and Chiara ARMENI ⌚ 5 credits [lecture: 24h] 📅 second term 🗨 French

# Bachelor in Geology

## Bloc 3 | BA-GEOL

### Cours obligatoires

GEOL-F205	<b>Thermodynamique appliquée à la géologie</b>   Sandra ARNDT (Coordinator) ⌚ 5 credits [lecture: 24h, tutorial classes: 24h] 📅 first term 🗨 French
GEOL-F3001	<b>Levés cartographiques et géologie de la Belgique</b>   Steeve BONNEVILLE (Coordinator) ⌚ 5 credits [field trips: 54h] 📅 second term 🗨 French
GEOL-F304	<b>Micropaléontologie et microfaciès</b>   Xavier DEVLEESCHOUWER (Coordinator) ⌚ 5 credits [lecture: 20h, practical work: 24h, field trips: 16h] 📅 second term 🗨 French
GEOL-F305	<b>Géodynamique et Pétrologie Magmatique et Métamorphique</b>   Nadine MATTIELLI (Coordinator) ⌚ 10 credits [lecture: 18h, practical work: 60h, field trips: 40h] 📅 first and second terms 🗨 French
GEOL-F306	<b>Cristallographie et Minéralogie Appliquée</b>   Karen FONTIJN (Coordinator) ⌚ 5 credits [lecture: 12h, practical work: 34h, project: 20h] 📅 second term 🗨 French
GEOL-F307	<b>Cycle de la matière et de l'énergie dans les systèmes géologiques</b>   Pierre REGNIER (Coordinator) and Steeve BONNEVILLE ⌚ 5 credits [lecture: 36h, tutorial classes: 24h] 📅 second term 🗨 French
GEOL-F309	<b>Géophysique et tectonophysique</b>   Corentin CAUDRON (Coordinator) and Thomas LECOCQ ⌚ 5 credits [lecture: 22h, tutorial classes: 12h, seminars: 10h, field trips: 16h] 📅 first term 🗨 French
GEOL-F312	<b>Projet de recherche et communication scientifique</b>   Sandra ARNDT (Coordinator) and Karen FONTIJN ⌚ 5 credits [lecture: 6h, project: 50h] 📅 academic year 🗨 French
GEOL-F319	<b>Introduction à la métallogénie et industrie minérale</b>   Johan YANS (Coordinator) ⌚ 5 credits [lecture: 12h, practical work: 24h, field trips: 8h] 📅 second term 🗨 French
LANG-F301	<b>Anglais scientifique II</b>   Hugh MURPHY (Coordinator), David Albert BEST and Alexander CORNFORD ⌚ 5 credits [tutorial classes: 48h] 📅 first term 🗨 English
MATH-F316	<b>Biogéostatistiques</b>   Thomas VERDEBOUT (Coordinator) ⌚ 5 credits [lecture: 30h, tutorial classes: 24h] 📅 second term 🗨 French