

#### Block 1

The program of the first two terms is identical to the program of Block 1 of the Master's degree in Civil Mining Engineering and Geology :

- 30 compulsory course credits

- 30 elective credits: the elective courses will be chosen in agreement with the president of the jury who will ensure the coherence of the program. For Block 2, the focus started at ULiège will be completed at the Polytechnic University of Madrid.

#### Compulsory Courses

CHIM9284-2	<i>Analytical chemistry I - Chemical analysis methods , Theory</i> - Gauthier EPPE	Q1	20	-	-	2
CHIM0740-2	<i>Analytical chemistry II - Physicochemical techniques of analysis, Part A</i> - Gauthier EPPE	Q2	10	30	-	3
GEOL0006-4	<i>Rocks and sedimentary processes (partie 1)</i> - Frédéric BOULVAIN - [4h Labo.]	Q1	30	-	[+]	2
GEOL0284-1	<i>Geology of Wallonia</i> - Frédéric BOULVAIN - [6d FW]	Q2	20	-	[+]	3
GEOL1042-1	<i>Geological imaging and inverse modeling (english language)</i> - Frédéric NGUYEN, Eric PIRARD - [30h Proj.]	Q2	30	10	[+]	5
GCIV0045-4	<i>Rock mechanics, tunnels, rock slopes, rock foundations</i> - Robert CHARLIER - [1d FW, 50h Proj.]	Q2	20	4	[+]	5
GEOL0097-2	<i>Geostatistics (english language)</i> - Eric PIRARD - [30h Labo.]	Q1	30	-	[+]	5
GEOL0286-2	<i>Geological mapping</i> - <i>From theory to fieldwork</i> - HansBalder HAVENITH - [2d FW] - <i>Project</i> - HansBalder HAVENITH - [20h Proj.]	Q2	5	20	[+]	5
					[+]	

#### Optional courses

Choose 10 credits between:

##### Courses programme at University of Liège

GEOL0021-7	<i>Geophysical prospecting</i> - Lucien HALLEUX, Frédéric NGUYEN - [5d FW, 20h Proj.]	Q2	26	20	[+]	5
GEOL0020-7	<i>Mineral resources (english language)</i> - Eric PIRARD - [1d FW, 26h Labo., 32h Proj.]	Q1	26	-	[+]	5
GEOL0319-2	<i>Geological hazard and risk assessment (english language)</i> - <i>From theory to field work</i> - HansBalder HAVENITH - [2d FW] - <i>Project</i> - HansBalder HAVENITH - [20h Proj.]	Q2	25	10	[+]	5
					[+]	
GEOL0013-5	<i>Hydrogeology</i> - <i>Part A</i> - Alain DASSARGUES - [1d FW] - <i>Part B</i> - Alain DASSARGUES - [10h Proj.]	Q1	26	20	[+]	5
					[+]	
GCIV0603-2	<i>Geotechnics and infrastructure</i> - Robert CHARLIER - [1d FW, 2h Labo.]	Q2	26	26	[+]	5
GEOL0314-1	<i>Mineral processing I - basics (english language)</i> - Stoyan GAYDARDZHIEV - [30h Labo., 10h Proj., 1,5d FW]	Q1	30	-	[+]	5
GEOL1026-1	<i>Complement of geology</i> - <i>Part 1 : Elements of mineralogy</i> - Frédéric HATERT - <i>Part 2 : Elements of magmatic and metamorphic petrology</i> - Jacqueline VANDER AUWERA	Q2	18	18	-	5
			8	8	-	
GCIV0185-7	<i>Linear numerical methods in Civil and Geological Engineering</i> - Laurent DUCHENE, Michel PIROTTON - [30h Proj.]	Q1	22	30	[+]	5
GEOL0008-1	<i>Hydrocarbons in the energy transition</i> - <i>Geology applied to the exploration of hydrocarbons</i> - Pierre CORNET - <i>Unconventional hydrocarbon extraction techniques</i>	Q1	15	-	-	5
			15	-	-	

### Master of Science (MSc) in Geological and Mining Engineering (Co-diplomation avec l'Université polytechnique de Madrid)

GEOL0029-4	<i>Tectonics</i> - Part A - Olivier BOLLE - Field work - Olivier BOLLE - [2d FW]	Q1	30	20	-	[+]	5
MECA0526-1	<i>High Temperature Processes in Recycling &amp; Remanufacturing</i> (english language) - Anne MERTENS	Q1	26	26	-		5
GEOL0310-1	<i>Project</i> - COLLÉGIALITÉ, Stoyan GAYDARDZHIEV, Frédéric NGUYEN - [4d FW, 10h Labo., 90h Proj.]	TA	10	-		[+]	5
or among the courses listed below related to the theme "Urban and Environmental Engineering"							
UEEN0001-1	<i>Water and energy in urban environment</i> (english language) - Pierre DEWALLEF, Benjamin DEWALS - [2d FW]	Q1	26	26		[+]	5
UEEN0002-1	<i>Urban recycling : land and wastes</i> (english language) - Serge BROUYÈRE, Luc COURARD - [10h Labo., 20h Proj., 2d FW]	Q1	20	10		[+]	5
UEEN0003-1	<i>Resilience and constructions in urban areas</i> (english language) - Sigrid REITER - [60h Proj., 1d FW]	Q1	12	12		[+]	5
UEEN0004-1	<i>Urban planning and transportation</i> (english language) - Mario COOLS, Mario COOLS - [1d FW]	Q1	26	26		[+]	5
UEEN0005-1	<i>Urban sociology and co-design</i> (english language) - Stéphane DAWANS, Catherine ELSEN - [20h Proj., 1d FW]	Q1	20	10		[+]	5
UEEN0006-1	<i>UEE project</i> (english language) - Shady ATTIA, Frédéric NGUYEN, Philippe RIGO - [100h Proj., 1d FW]	Q1	-	90		[+]	5

#### Choose between these two focus

##### Environmental and Geological Engineering

GEOL0083-3	<i>Groundwater modelling</i> (english language) - Alain DASSARGUES - [30h Labo., 30h Proj.]	Q1	30	-		[+]	5
GEOL1028-1	<i>Site investigation</i> - Serge BROUYÈRE, Frédéric NGUYEN - [40d Proj., 40h Labo., 5d FW]	Q2	5	-		[+]	5
GEOL1046-1	<i>Geothermy</i> (english language) - Robert CHARLIER, Alain DASSARGUES, HansBalder HAVENITH - [40h Proj., 1d FW]	Q2	18	15		[+]	5
GEOL0277-1	<i>Groundwater quality and protection</i> (english language) - Serge BROUYÈRE - [1d FW, 35h Proj.]	Q1	20	20		[+]	5

##### Mineral Resources & recycling

GEOL0289-1	<i>Analytic mineralogy</i> (english language) - Frédéric HATERT - [15h Labo.]	Q2	30	15		[+]	5
GEOL0315-1	<i>Solid Waste and by products processing</i> (english language) - Stoyan GAYDARDZHIEV - [20h Labo., 7h Proj., 1,5d FW]	Q1	20	-		[+]	5
GEOL0237-2	<i>Exploitation of mineral deposits</i> - - Suppl : Eric POOT - [2d FW]	Q1	25	15		[+]	5
GEOL0312-1	<i>Process mineralogy</i> (english language) - Eric PIRARD - [25h Labo., 15h Proj.]	Q1	25	-		[+]	5

#### Block 2

##### Optional courses

#### Choose between these two focus:

##### Environmental and Geological Engineering

Choose 10 credits from this list to complete your focus:

[...] Management of the Natural Environment Specialty

HULG9434-1	<i>Recursos Hidrogeológicos</i> (spanish language)	Q1	-	-	-		6
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HULG9435-1	<i>Riesgos Geológicos</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9436-1	<i>Ingeniería de Costas y puertos</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9437-1	<i>Hidráulica e Ingeniería Fluvial</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9438-1	<i>Sismología e ingeniería Sísmica</i> (spanish language)	Q1	-	-	-	<b>6</b>

#### Mineral Resources & recycling

Choose 10 credits from this list to complete your focus:

[...] Research and Management of Mineral Resources Specialty

HULG9439-1	<i>Economía de los Recursos Minerales</i> (spanish language)	Q1	-	-	-	<b>3</b>
HULG9440-1	<i>Mineralogía Avanzada</i> (spanish language)	Q1	-	-	-	<b>4,5</b>
HULG9441-1	<i>Técnicas de Investigación y Caracterización de Yacimientos Minerales</i> (spanish language)	Q1	-	-	-	<b>3</b>
HULG9442-1	<i>Exploración y Evaluación de Yacimientos Minerales</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9443-1	<i>Yacimientos Minerales</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9444-1	<i>Investigación y Gestión de Recursos Energéticos</i> (spanish language)	Q1	-	-	-	<b>3</b>
HULG9445-1	<i>Petrología y Modelización de Recursos Minerales</i> (spanish language)	Q1	-	-	-	<b>4,5</b>

Choose the remaining credits in your specialty

[...] Research and Management of Mineral Resources Specialty [b]or[/b] Research and Management of Mineral Resources Specialty

HULG9434-1	<i>Recursos Hidrogeológicos</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9435-1	<i>Riesgos Geológicos</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9436-1	<i>Ingeniería de Costas y puertos</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9437-1	<i>Hidráulica e Ingeniería Fluvial</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9438-1	<i>Sismología e ingeniería Sísmica</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9439-1	<i>Economía de los Recursos Minerales</i> (spanish language)	Q1	-	-	-	<b>3</b>
HULG9440-1	<i>Mineralogía Avanzada</i> (spanish language)	Q1	-	-	-	<b>4,5</b>
HULG9441-1	<i>Técnicas de Investigación y Caracterización de Yacimientos Minerales</i> (spanish language)	Q1	-	-	-	<b>3</b>
HULG9442-1	<i>Exploración y Evaluación de Yacimientos Minerales</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9443-1	<i>Yacimientos Minerales</i> (spanish language)	Q1	-	-	-	<b>6</b>
HULG9444-1	<i>Investigación y Gestión de Recursos Energéticos</i> (spanish language)	Q1	-	-	-	<b>3</b>
HULG9445-1	<i>Petrología y Modelización de Recursos Minerales</i> (spanish language)	Q1	-	-	-	<b>4,5</b>

Choose between third semester at Liège or Madrid:

#### Third semester at Université de Liège:

ATFE0011-1	<i>Master Thesis (including an introduction to research methodology)</i> - COLLÉGIALITÉ, Frédéric NGUYEN - [600h Proj.]	TA	-	-	[+]	<b>20</b>
ASTG0017-1	<i>Internship</i> - Serge BROUYÈRE	TA	-	-	-	<b>5</b>
GEST3162-1	<i>Principles of management</i> (english language) - Michael GHILISSEN, François PICHULT	Q1	25	25	-	<b>5</b>

#### Third semester at Universidad Politécnica de Madrid

HULG9446-1	<i>Master Thesis</i> (spanish language)	-	-	-	-	<b>18</b>
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HULG9447-1	<i>Internship</i> (spanish language)	-	-	-	<b>6</b>
HULG9448-1	<i>Elective courses</i> (spanish language)	-	-	-	<b>6</b>