

Field : *Earth sciences*

Master in Branch : *Applied geology*

Speciality : *Hydrogeology*

Brief

Hydrogeology is the branch of applied geology that deals with the study of groundwater, including its distribution, movement, and quality. It involves understanding the interaction between groundwater and geologic formations, as well as the physical, chemical, and biological processes affecting groundwater resources. Hydrogeologists use a variety of tools and techniques to study groundwater, including drilling, mapping, and modeling, to better understand and manage these important resources. The training in hydrogeology provides students with a strong foundation in the principles and techniques used to study groundwater, including:

1. Understanding the geology and hydrology of subsurface water systems.
2. Knowledge of drilling, sampling, and testing methods for groundwater.
3. Familiarity with geological and geophysical techniques for mapping and imaging the subsurface.
4. Understanding of the physical, chemical, and biological processes affecting groundwater quality and availability.
5. Skills in using mathematical and computer models to simulate and understand groundwater flow and transport.
6. Knowledge of laws and regulations related to groundwater management and protection.
7. Understanding of the impacts of human activities, such as groundwater pumping and contamination, on groundwater resources.

For the Master's degree, all students must undertake a three-semester course of study, culminating in a final project that will be presented and defended during the fourth semester.

Field	Branch	Speciality
<i>Earth Sciences</i>	<i>Applied geology</i>	<i>Hydrogeology</i>

First Semester

Teaching unit	Matter	Credit	Coefficient	C	TD	TP	Volume (hour)
Fundamental Unit	General hydraulics	4	2	3h00	1h30		45h00
	General hydrogeology	4	2	1h30	1h30		45h00
	Surface water hydrology	4	2	1h30	1h30		45h00
	Groundwater dynamics	6	3	1h30	1h30	1h30	67h30
Methodological unit	Integrated Water Resources Management	1	1	1h30			22h30
	Applications of GIS in hydrogeology	4	2	1h30		1h30	45h00
	Statistics and data analysis	4	2	1h30	1h30		45h00
Discovery unit	Topography	2	2	1h30	1h30		45h00
Transversale Unit	Technical English 1	1	1	1h30			22h30

Second Semester 2

Teaching unit	Matter	Credit	Coefficient	C	TD	TP	Volume (hour)
Fundamental Unit	Groundwater flow systems and cartography	4	2	3h00	1h30		45h00
	Applied geophysics	4	2	1h30		1h30	45h00
	Simulation and groundwater flow modeling	4	2	1h30	1h30		45h00
	Hydrochemical and isotopic analysis of groundwater	6	3	1h30	1h30	1h30	67h30
Methodological unit	Water well drilling methods	4	2	1h30	1h30		45h00
	Applied remote sensing	4	2	1h30		1h30	45h00
	Thermo-mineral water	1	1	1h30			22h30
Discovery unit	Hydrogeology of Algeria	2	2	1h30	1h30		45h00
Transversale Unit	Technical English 2	1	1	1h30			22h30

Third Semester

Teaching unit	Matter	Credit	Coefficient	C	TD	TP	Volume (hour)
Fundamental Unit	Water treatment and reuse	4	2	3h00	1h30		45h00
	Groundwater pollution and protection	4	2	1h30	1h30		45h00
	Karstic aquifers (study methods)	4	2	1h30	1h30		45h00
	Geostatistics	6	3	1h30	1h30	1h30	67h30
Methodological unit	Groundwater quality analysis	4	2	1h30		1h30	45h00
	Well logging	4	2	1h30		1h30	45h00
	Well rehabilitation	1	1	1h30			22h30
Discovery unit	Project management and work safety	1	1	1h30			22h30
	Regulations for Environmental and Water Protection	1	1	1h30			22h30
Transversale Unit	Tuored project	1	1	1h30			22h30

Forth Semester

Internship in a company sanctioned by a thesis and a defense.

	VHS	Coeff	Crédits
Personal Work			
Internship in a company	280	8	12
Seminars			
Master Theis	280	9	18
Total Semester 4	560	17	30