

# Master of Science in Hydrogeology and Geothermics

(from the academic year 2020-2021)

## General structure of the M Sc in Hydrogeology and Geothermics (120 ECTS)

Modules	ECTS	Status	Semester
Introductory courses	8	obligatory	A1
Processes in hydrogeology and geothermics	12	obligatory	A1
Water-earth systems	10	obligatory	A1
Site/resource characterisation	14	obligatory	S1
Modelling I	7	obligatory	S1
Engineering and resource exploitation	9	obligatory	S1
Modelling II	7	obligatory	A2
Resource management	14	obligatory	A2
Master thesis preparation and Master thesis research	39	obligatory	A2+S2
<b>Total ECTS of Master</b>	<b>120</b>		

Modules and courses	Hours of courses	Semester	ECTS	Persons in charge	Evaluation mode
---------------------	------------------	----------	------	-------------------	-----------------

<b>Introductory courses</b>				<b>8 ECTS</b>	
Introduction to hydrogeology and hydrology	30	A1	3	Prof. P. Brunner	Written exam, 2 hours
Introduction to geothermics	20	A1	2	Prof. S. Miller	Written exam, 1 hour
Mathématiques et statistique	30	A1	3	Dr J. Straubhaar	Written exam, 1 hour

<b>Processes in hydrogeology and geothermics</b>				<b>12 ECTS</b>	
Hydrodynamique souterraine	40	A1	4	Prof. P. Perrochet	CA (graded)
Processus de transport	20	A1	2	Prof. P. Perrochet	
Hydrochemical and microbial processes	40	A1	4	Prof. D. Hunkeler	Written exam, 2 hours
Rock and earthquake mechanics	20	A1	2	Prof. S. Miller	Written exam, 1 hour

<b>Water-earth systems</b>				<b>10 ECTS</b>	
Alluvial aquifer systems: from quaternary geology to surface water-groundwater interactions	40	A1	4	Drs N.N. and G. Preisig, Profs P. Brunner and D. Hunkeler	CA (graded)
Systèmes aquifères fissurés et karstiques	40	A1	4	Prof. B. Valley, Dr P-Y. Jeannin	CA (graded)
Field camp I	4 days	A1	2	Drs N.N. and G. Preisig	CA (pass)

# Master of Science in Hydrogeology and Geothermics

(from the academic year 2020-2021)

Modules and courses	Hours of courses	Semester	ECTS	Persons in charge	Evaluation mode
<b>Site/resource characterisation</b>			<b>14 ECTS</b>		
Forages, tests hydrauliques, traceurs naturels et artificiels	60	S1	6	Profs P. Renard, B. Valley	CA (graded)
Geophysics	30	S1	3	Prof. S. Miller	CA (graded)
Remote sensing	20	S1	2	Prof. P. Brunner	CA (graded)
Field camp II	6 days	S1	3	Profs D. Hunkeler, P. Brunner and Dr G. Preisig	CA (pass)
<b>Modelling I</b>			<b>7 ECTS</b>		
Modélisation des réservoirs	20	S1	2	Prof. P. Renard	CA (graded)
Modélisation des écoulements et des processus de transport	50	S1	5	Dr G. Preisig	CA (graded)
<b>Engineering and resource exploitation</b>			<b>9 ECTS</b>		
Systèmes géothermiques peu profonds	20	S1	2	Dr V. Badoux	CA (graded)
Advanced geothermics and earth energy resources	30	S1	3	Prof. S. Miller	CA (graded)
Water supply and water treatment	20	S1	2	Prof. P. Brunner	CA (graded)
Ingénierie géotechnique	20	S1	2	Dr G. Preisig	CA (graded)
<b>Modelling II</b>			<b>7 ECTS</b>		
Numerical modelling of geomechanical processes	30	A2	3	Prof. S. Miller	CA (graded)
Géostatistique et modélisation inverse	40	A2	4	Profs P. Renard and P. Brunner	CA (graded)
<b>Resource management</b>			<b>14 ECTS</b>		
Water resource management in the European context	20	A2	2	Profs P. Brunner and D. Hunkeler	CA (graded)
Water resource management in semi-arid/arid regions and in humanitarian contexts	20	A2	2	Dr E. Milnes and Prof. P. Brunner	
Groundwater pollution and remediation	40	A2	4	Prof. D. Hunkeler	CA (graded)
Urban hydrogeology	20	A2	2	Prof. M. Schirmer	
Hydraulic tests in fractured aquifers	20	A2	2	Prof B. Valley	CA (pass)
Geothermal field trip	4 days	A2	2	Prof. S. Miller	CA (pass)

# Master of Science in Hydrogeology and Geothermics

(from the academic year 2020-2021)

Modules and courses	Hours of courses	Semester	ECTS	Persons in charge	Evaluation mode
<b>Master thesis preparation and Master thesis research</b>			<b>39 ECTS</b>		
Literature review, scientific writing and master project proposal	90	A2	9	Profs P. Brunner, D. Hunkeler, S. Miller, B. Valley, P. Renard	CA (pass)
Master thesis research		S2	30		CA <sup>1</sup>
<b>Total of M Sc in Hydrogeology and Geothermics</b>			<b>120 ECTS</b>		

## Abbreviations

CA (graded) = marked assignment, following teacher's instructions

CA (pass) = unmarked assignment (accepted/rejected)

CA<sup>1</sup> = marked thesis report + 1-hour-oral exam

A1 = autumn semester 2020

S1 = spring semester 2021

A2 = autumn semester 2021

S2 = spring semester 2022

## Transitional provisions

For courses with a content that has changed from earlier years, the students enrolled in earlier years must be examined on the earlier content. For all questions, please contact the person in charge of the Master.

## Information

Professor in charge : **Prof. Benoît Valley** (benoit.valley@unine.ch)

## Exams and regulation

Candidates must be registered in IS-Academia for both courses and exams.

**For regulation, please consult the homepage of the Faculty of Sciences, [www.unine.ch/sciences](http://www.unine.ch/sciences) ("règlement d'études et d'examens" and existing directives)**