

## Master of Science in Hydrogeology and Geothermics (from the academic year 2018)

### 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	9	obligatory	A2
Resource management	13	obligatory	A2
Master thesis preparation and Master thesis research	38	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
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<b>Introductory courses</b>					
Introduction to hydrogeology and hydrology	30	A1	3	Prof. P. Brunner	Written exam, 3 hours
Introduction to geothermics	20	A1	2	Prof. S. Miller	
Mathématiques et statistique	30	A1	3	Dr J. Straubhaar	

<b>Processes in hydrogeology and geothermics</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 and Dr S. Wirth	Written exam, 2 hours
Rock and earthquake mechanics	20	A1	2	Prof. S. Miller	Written exam, 1 hour

<b>Water-earth systems</b>					
Alluvial aquifer systems: from quaternary geology to surface water-groundwater interactions	40	A1	4	Drs S. Wirth 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 S. Wirth and G. Preisig	CA (pass)

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<b>Site/resource characterisation</b>			<b>14 ECTS</b>		
Forages, tests hydrauliques, traceurs naturels et artificiels	60	S1	6	Profs P. Renard, B. Valley and N.N.	CA (graded)
Geophysics	30	S1	3	Profs S. Miller	CA (graded)
Remote sensing	20	S1	2	Dr L. Halloran (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)
Earth energy resources	30	S1	3	Profs S. Miller and B. Valley	CA (graded)
Water supply and water treatment	20	S1	2	Dr L. Halloran (Prof. P. Brunner)	CA (graded)
Ingénierie géotechnique	20	S1	2	Dr G. Preisig	CA (graded)
<b>Modelling II</b>			<b>9 ECTS</b>		
Numerical modelling of hydrochemical processes	20	A2	2	Prof. D. Hunkeler	CA (graded)
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>13 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	30	A2	3	Prof. D. Hunkeler	CA (graded)
Urban hydrogeology	20	A2	2	Prof. M. Schirmer	
Economical, political and societal aspects of geothermics	20	A2	2	Profs S. Miller and B. Valley	CA (pass)
Geothermal field trip	4 days	A2	2	Prof. S. Miller	CA (pass)

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<b>Master thesis preparation and Master thesis research</b>			<b>38 ECTS</b>		
Literature review, scientific writing and master project proposal	80	A2	8	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 2018

S1 = spring semester 2019

A2 = autumn semester 2019

S2 = spring semester 2020

### 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 or the administrative staff of the Faculty.**

Transitional measures: personal adjusting for students beginning their Master before 2015-16 (please contact the person in charge of the Master).