

## Master of Science in Geography

Options:

- **Dynamics in Glaciology and Geomorphology**
- **Nature, Society and Politics**

# Welcome!!!

Credit points: **120 ECTS**

Duration: **4 semesters**

Language: **English**

Options:

- **Dynamics in glaciology and geomorphology**
- **Nature, Society and Politics**
  
- Specialized MSc. for non-geography students

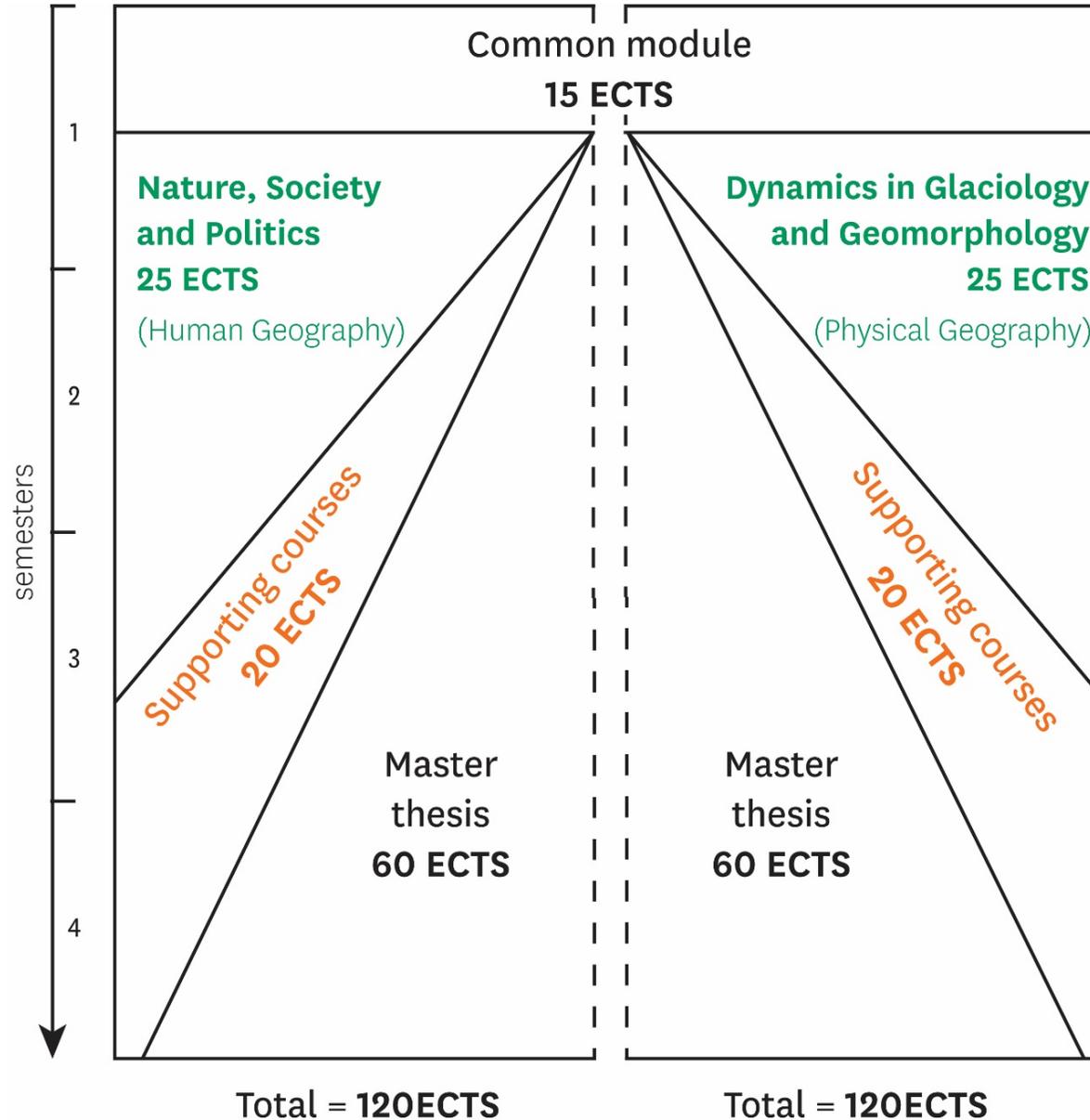
Validation deadline for the BSc. Thesis (TR): **15 October**

More : <https://www3.unifr.ch/geo/en/studies/geography/master.html>

Study advisor: Luc Braillard ( [geo-scimed@unifr.ch](mailto:geo-scimed@unifr.ch) )



# Master of Science in Geography



# Master of Science in Geography

Master study plan 120ECTS		http://www.unifr.ch/geoscience/geographie/en								
ECTS	1. Autumn semester	2. Spring semester		3. Autumn semester		4. Spring semester		ECTS		
1	SGG.00512 Geocolloquium I 1 ECTS	SGG.00512 Geocolloquium II 1 ECTS		SGG.00512 Geocolloquium III 1 ECTS		SGG.00454 <i>Field course II</i> 3 ECTS	SGG.00481 <i>Field course II</i> 3 ECTS	1		
2	SGG.00409 Models, modelling and representation 3 ECTS	SGG.00410 Master thesis preliminary seminar 2 ECTS		SGG.00450 <i>Seminar in climatology and glaciology II</i> 2 ECTS				SGG.00503 Master thesis		2
3						SGG.00452 <i>Seminar in geomorphology II</i> 2 ECTS	Supporting courses			3
4		SGG.00441 <i>Applied geophysical methods</i> 3 ECTS	SGG.00471 <i>New approaches in human geography</i> 3 ECTS							SGG.00473 <i>Seminar in global change, development and ethics</i> 3 ECTS
5	SGG.00426 Climate change: state of the art and debates 3 ECTS	SGG.00443 <i>Project in cryosphere and geomorphology</i> 3 ECTS		SGG.00477 <i>Political ecology</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS	SGG.00480 <i>Field course I</i> 3 ECTS	5		
6	SGG.00424 Hazards, risks and vulnerability 3 ECTS	SGG.00445 <i>Mountain geomorphology</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS				SGG.00503 Master thesis		6
7		SGG.00443 <i>Project in cryosphere and geomorphology</i> 3 ECTS	SGG.00473 <i>Seminar in global change, development and ethics</i> 3 ECTS				SGG.00480 <i>Field course I</i> 3 ECTS			7
8	SGG.00425 Data and methods for environmental analysis 3 ECTS	SGG.00448 <i>Modelling of glacier and permafrost</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis			8	
9		SGG.00444 <i>Alpine Cryosphere</i> 3 ECTS	SGG.00486 <i>Advanced social research methods</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00480 <i>Field course I</i> 3 ECTS		9	
10	SGG.00449 <i>Seminar in climatology and glaciology I</i> 2 ECTS	SGG.00484 <i>Seminar in social theories</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis			10	
11	SGG.00451 <i>Seminar in geomorphology I</i> 2 ECTS	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS			SGG.00503 Master thesis			11
12	R022.0211 <i>B2-C2 English for master students of science I</i> 3 ECTS	Supporting courses		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis				12
13		Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis			13
14	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis				14
15	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS			SGG.00503 Master thesis			15
16	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis				16
17	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS			SGG.00503 Master thesis			17
18	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis				18
19	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS			SGG.00503 Master thesis			19
20	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis				20
21	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS			SGG.00503 Master thesis			21
22	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis				22
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25	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS			SGG.00503 Master thesis			25
26	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis				26
27	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS			SGG.00503 Master thesis			27
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30	Supporting courses	SGG.00487 <i>Issues in environmental ethics</i> 3 ECTS		SGG.00485 <i>Environmental history</i> 3 ECTS		SGG.00503 Master thesis				30

Common module (15 ECTS)

Physical geography option (25 ECTS)<sup>a</sup>

<sup>a</sup>15 ECTS mandatory courses and 18 ECTS elective courses

Human geography option (23 ECTS)<sup>b</sup>

<sup>b</sup>15 ECTS mandatory courses and 13 ECTS elective courses

Supporting courses module (20 ECTS)<sup>c</sup>

<sup>c</sup> Free choice within the science faculty, the university of Fribourg and other universities.

Master thesis module (60 ECTS)

Contact:  
[geo-scimed@unifr.ch](mailto:geo-scimed@unifr.ch)

SGG.00502 : 25 Geocolloquium sessions can be attended over 4 semesters

# Geocolloquium 2021

Tuesday 4.15 – 6 p.m., PER 22, Lecturing Hall Joseph Deiss (002)

21.09.21	Prof. Walter Joyce (UniFr): Reproduction in the fossil record
28.09.21	<del>Dr. Pierluigi Calanca (Agroscope): Climate analogues for informing adaptation – potential and limitations</del>
05.10.21	Dr. Stephan Schulz (Uni Darmstadt, DE): Groundwater resources in water scarce environments
12.10.21	Prof. Catalina Pimiento (Uni Zürich): Functional consequences of extinctions: from giant sharks to tiny mollusks
19.10.21	Prof. Christine Bichsel (UniFr): White spots on rivers of gold: imperial glaciers in Russian Central Asia.
26.10.21	Dr. Teea Kortetmäki (Uni Jyväskylä, FI): Cohabitability: towards the environmental ethics of land use in appropriated lands.
02.11.21	Prof. Francisco Klauser (Uni Neuchâtel): Big Brother meets Animal Farm: drones as mediators of volumetric agriculture
09.11.21	Dr. Regula Frauenfelder (Norwegian Geotechnical Institute, NO): TBA
16.11.21	Pia Hollenstein (ehemalige Nationalrätin), Dr. Dominic Roser (Uni Fribourg), Prof. Ivo Wallimann-Helmer (Uni Fribourg): Das Klima einklagen?
23.11.21	Dr. Diego Pozzorini (Dr Baumer SA Geologi Consulenti Losone, Ticino): TBA
30.11.21	Dr. Tazio Strozzi (GAMMA Remote Sensing, Gümligen): Multi-frequency and multi-platform radar interferometry for mapping slope movements in Alpine environments
07.12.21	Frederik Rademakers (British Museum, UK): Reconstructing ancient metal production in the Nile Valley: geochemistry as part of a holistic approach
14.12.21	Prof. Giuliana Panieri (Centre for Arctic Gas Hydrate, Environment and Climate, Tromsø, NO): Foraminifera from extreme Arctic methane seeps
21.12.21	Dr. Katrina Kremer (Swiss Seismological Service – SED/ETHZ): Tsunamis in Switzerland: from causes to hazard

# Master seminar (final) SGG.00503

Mondays 3.15. p.m., room 226

20 minutes presentations followed by a Q&A session of 10 minutes

**04.10.21; 22.11.21; 20.12.21**

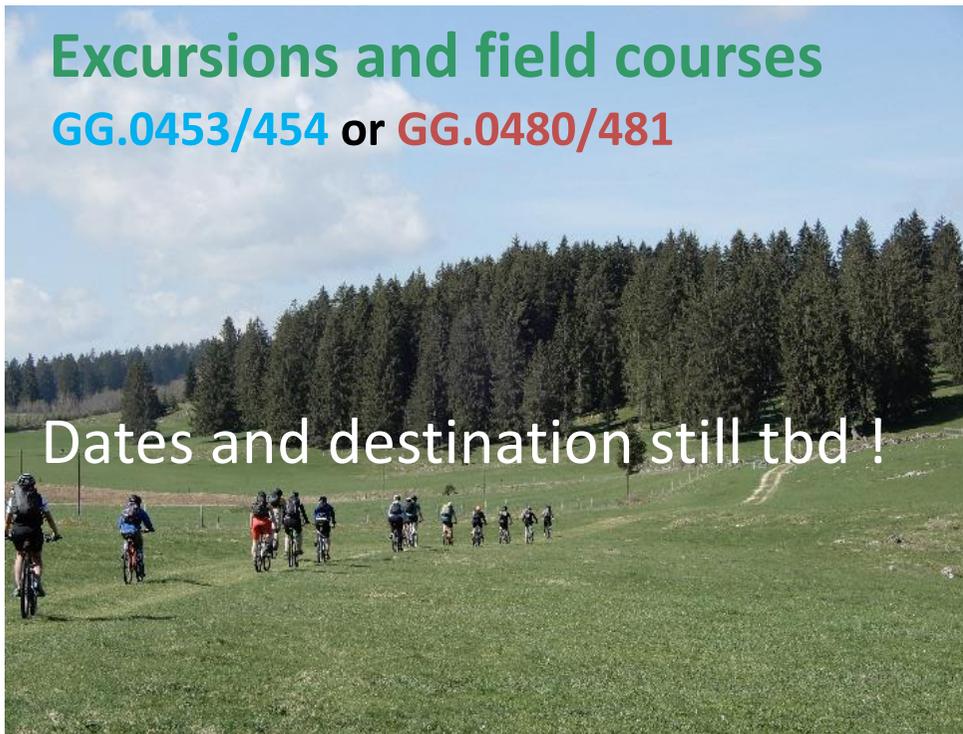
# Master seminar (preliminary) SGG.00410

Organized on demand in each research group

# Excursions and field courses

GG.0453/454 or GG.0480/481

Dates and destination still tbd !



Bike tour 2018

## Supporting courses

### Dynamics in glaciology and geomorphology

- Other groups/departments at UNIFR:  
Geology, Physics, Mathematics, Informatics
- Other Swiss universities:  
**ETHZ:** Glaciology and hydrology  
**UZH :** Glaciology, Remote sensing and GIS  
**UNIL:** Remote sensing and quantitative methods in geomorphology, Geoheritage  
**UNIBE:** Climatology, hydrology  
**UNINE:** Hydrogeology
- Further:  
**UNIS** (Svalbard) and **University of Oslo** : Glaciology, Permafrost, Geophysics and Remote Sensing

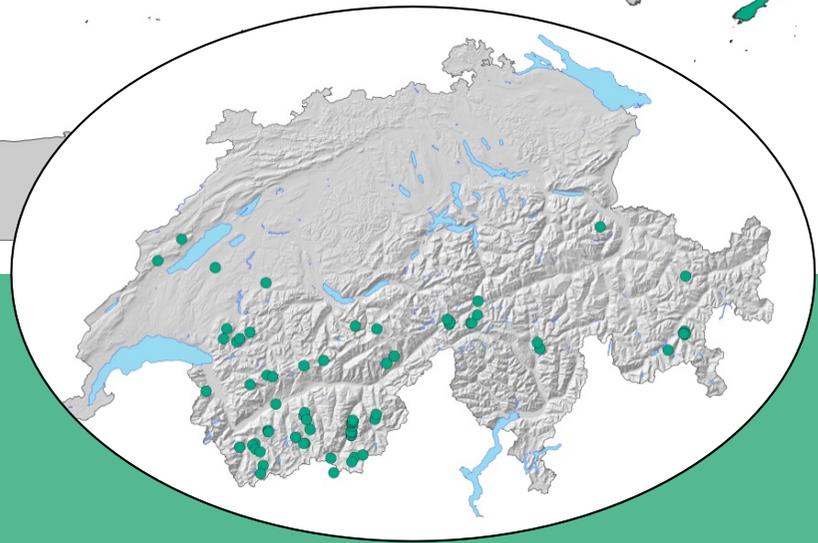
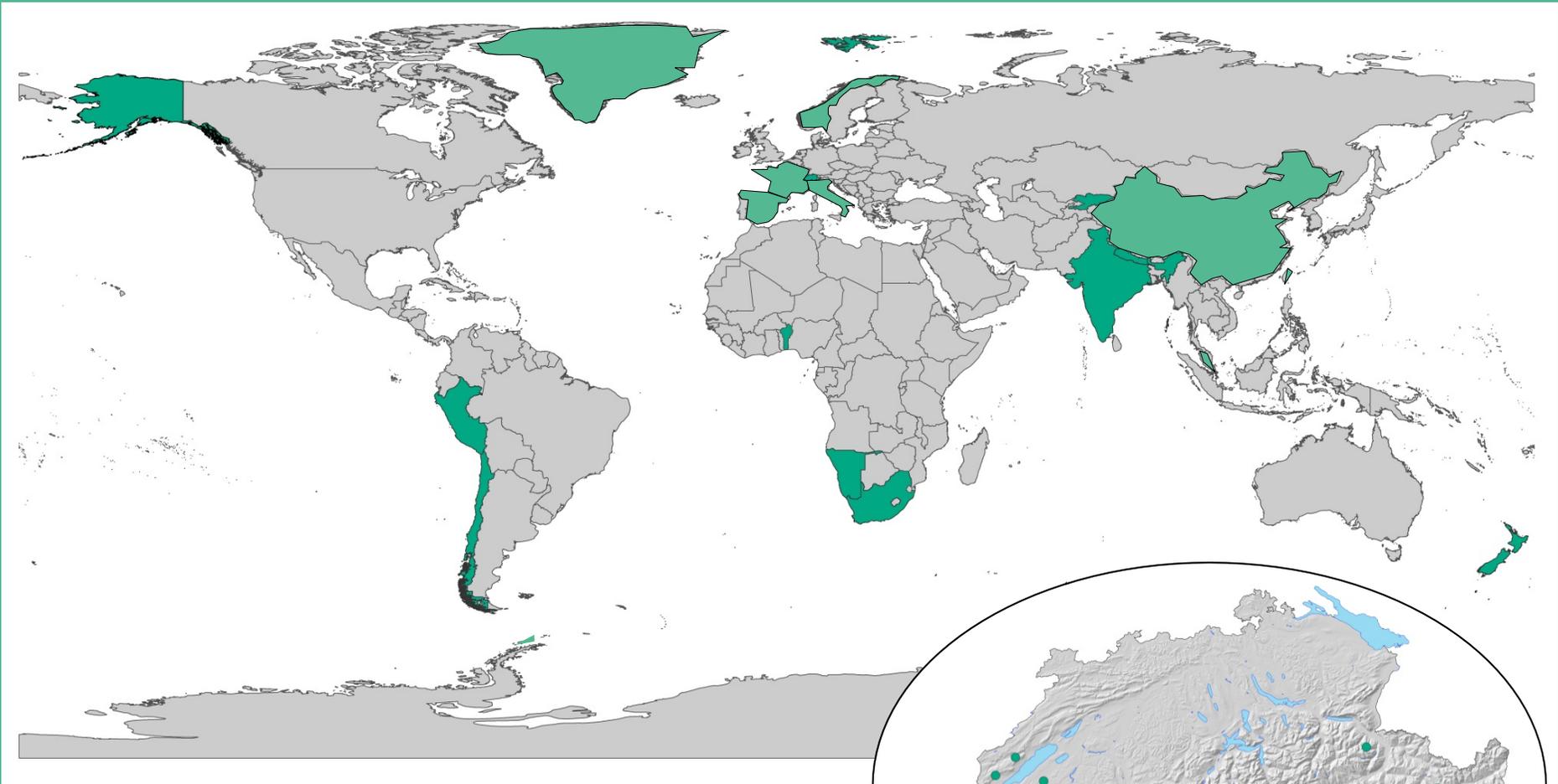
### Nature, Society and Politics

- Other departments at UNIFR:  
Social sciences, Anthropology, Economy etc.
- Other Swiss universities:  
**UNIGE:** Political and cultural geography  
**UZH :** Geographies of Global Change: Resources, Markets and Development  
**UNIL:** Urban and regional planning  
**UNIBE:** Economic, Social and Environmental History  
**UNINE:** Migrations and current challenges
- Further: **ERASMUS**

For teaching oriented students (DEEM): you **cannot** validate a course **twice**, once in your supporting courses module and in your BC+30 (BC30 or BC60) module!!!

Please collect the registration form for the supporting courses at the secretariat.

# Where do we work ?

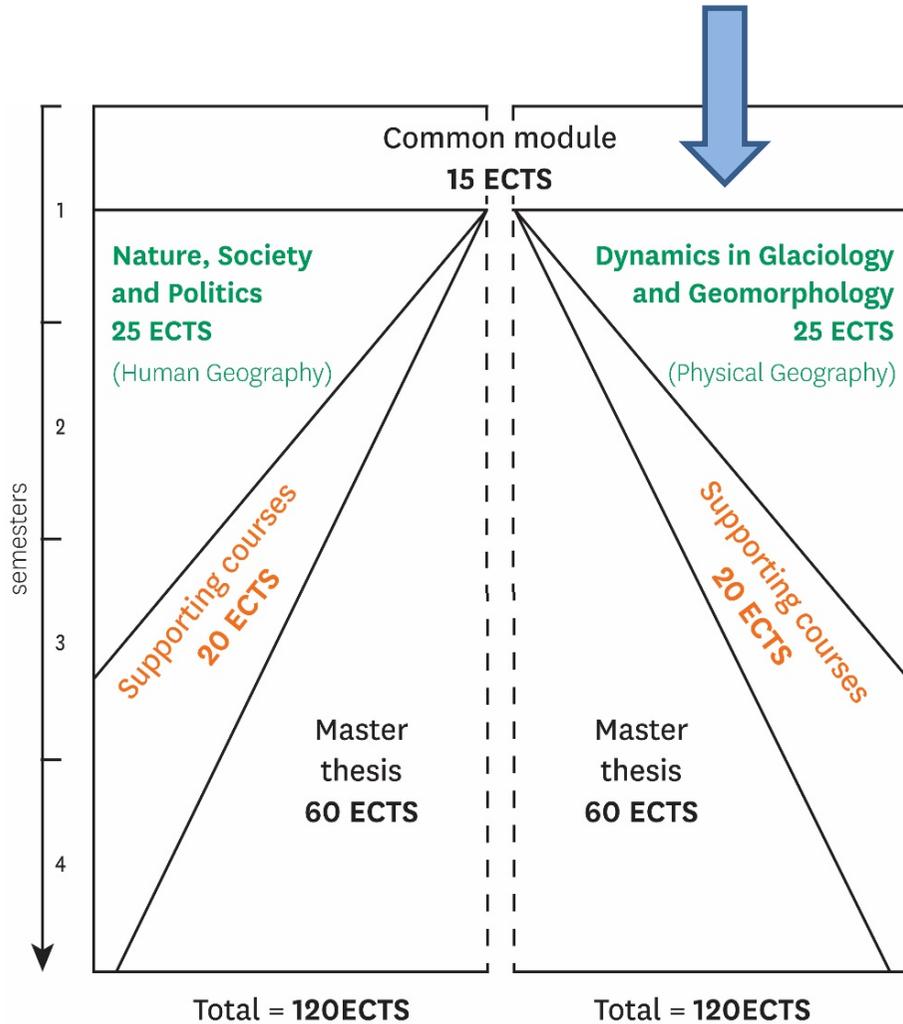


# Master of Science in Geography

Option:

## Dynamics in Glaciology and Geomorphology

# Option: Dynamics in Glaciology and Geomorphology



Master study plan 120ECTS <http://www.unifr.ch/geoscience/geographie/en>

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14				SGG.00480 Field course I 3ECTS	14
15				SGG.00453 Field course I 3ECTS	15
16	SGG.00449 Seminar in climatology and glaciology I 2ECTS	SGG.00484 Seminar in social theories 3ECTS			16
17					17
18	SGG.00451 Seminar in geomorphology I 2ECTS	SGG.00487 Issues in environmental ethics 3ECTS			18
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# What are the aims of this Master programme ?

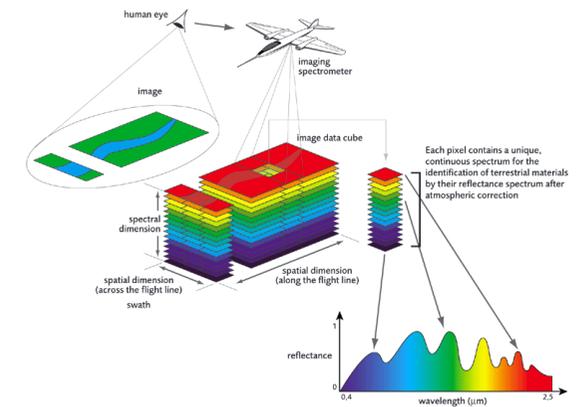
- Comprehensive knowledge of processes in **Glaciology (Cryosphere)**
- Comprehensive knowledge of processes in **Geomorphology**
- Comprehensive knowledge of the **Climate System and its changes**

## Methods & techniques

gather extensive experience in the following state of the art techniques:

- **Analysis of climate data** and **climate model** data
- **Field techniques** in Glaciology and Geomorphology (mass balance, geodetic surveying (D-GPS), Terrestrial Laser Scanning, Ground-Penetrating-Radar (GPR), geoelectric and electromagnetic methods, seismic surveying, energy balance measurements, etc.)
- **Numerical modelling** (glacier mass balance, empirical-statistical models, energy balance models, geophysical models, soil models, permafrost models, natural hazards)
- **Geographical Information Systems (GIS)**
- **Remote sensing**

Teaching staff: M. Hoelzle, R. Delaloye, C. Hauck, H. Machguth, L. Braillard, N. Salzmann, E. Pohl, C. Hilbich, C. Pellet, M. Scherler, M. Huss, A. Linsbauer, A. Tedstone, M. Guidicelli, M. Kronenberg, J. Wicky, T. Maierhofer, J. Wee, S. Balasubramanian, T. Mathys, N. Clerx, N. Jullien, D. Amschwand, C. Metraux, S. Morard, L. Maescot, C. Graf



# What will you do within the Master programme ?

## Lectures:

- **Alpine Cryosphere** (incl. 2 day excursion to the Swiss Alps)
- **Mountain geomorphology** (incl. mountain excursions)
- **Hazards, risk & vulnerability** (incl. external lecturers from federal/cantonal offices, risk/hazard modellers etc)

## Hands-on practical work:

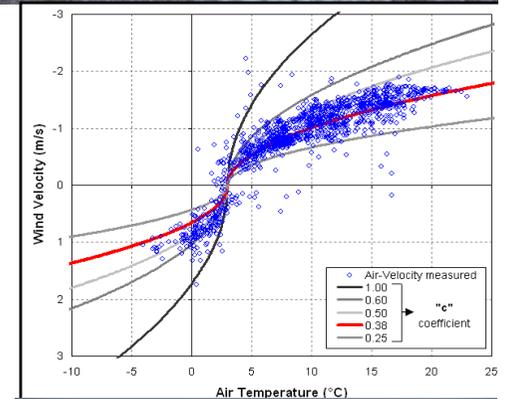
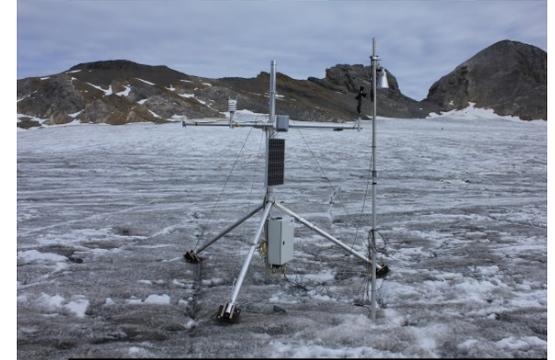
- **Data and methods for environmental analysis** (computer lab)
- **Applied Geophysical Methods** (1-week field course)
- **Modelling of Glaciers & Permafrost** (computer lab)
- **Field Course/Excursion** (destination changes every year)

## Seminars:

- **Climate Change: state of the art and debates**
- **Seminar in Climatology and Glaciology I & II** (literature reading and analysis, yearly changing topics)
- **Seminar in Geomorphology I & II** (incl. practical work & excursions, yearly changing topics)

## Projects:

- **Project in cryosphere & geomorphology**
- **MASTER THESIS**



## Examples of topics for Master thesis

The connection between atmospheric circulation and melt extent on the Greenland ice sheet ([remote sensing, ice sheets](#)) – Horst Machguth

Environmental change patterns: Numerical identification of changes in climate and hydrological time series ([climate, hydrology, time series analysis](#)) - Eric Pohl

Deriving air-ground temperature transfer functions for a permafrost landscape in Syrdakh, Eastern Siberia ([permafrost, statistics, database](#)) - Eric Pohl

The hydro-climatology in Central Asia from space and reanalysis: Comparing current remote sensing, and reanalysis data regarding precipitation and temperature ([remote sensing, reanalysis, number crunching, statistics](#)) - Eric Pohl

Area-volume scaling to quantify the total ground ice content in rock glaciers vs in-situ measurements – are current approaches overestimate the real ice content ? ([rock glaciers, ground ice content](#)) – Christin Hilbich

Heat waves and soil moisture memory effect in mountain areas ([natural hazards, climate change, soil moisture](#)) – Christian Hauck

Detecting subsurface water flow and water infiltration at the permafrost site Schilthorn, Swiss Alps, by using multiple data sets and measurement methods ([permafrost, hydrology, geophysical methods](#)) – Christian Hauck

Rock glaciers and ice content in Pamir ([Cryosphere Central Asia, permafrost](#)) – Tamara Mathys/Martin Hoelzle

Englacial temperature measurements on Central Asian glacier – Martin Hoelzle

Topics within geomorphology – quaternary research group – Reynald Delaloye/Luc Braillard



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Option:

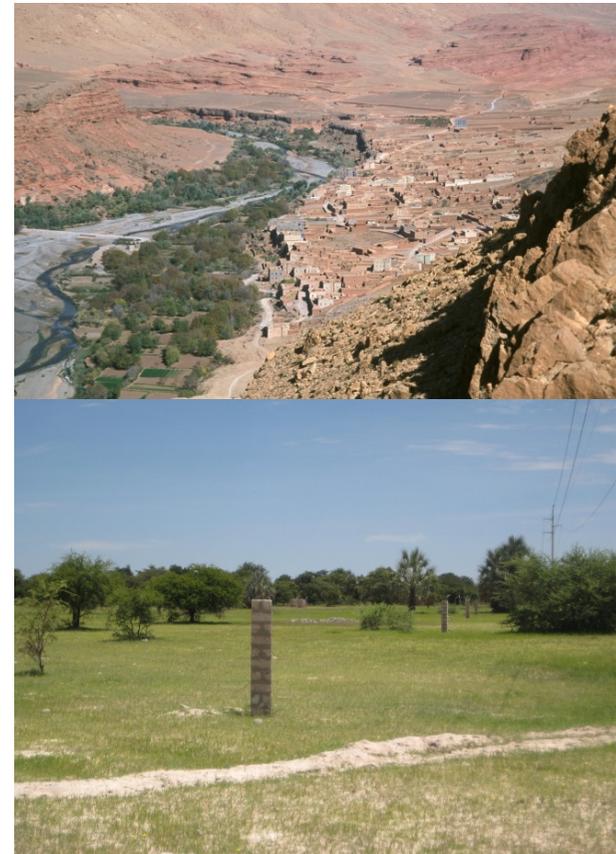
## Nature, Society and Politics

# Option: Nature, society and politics

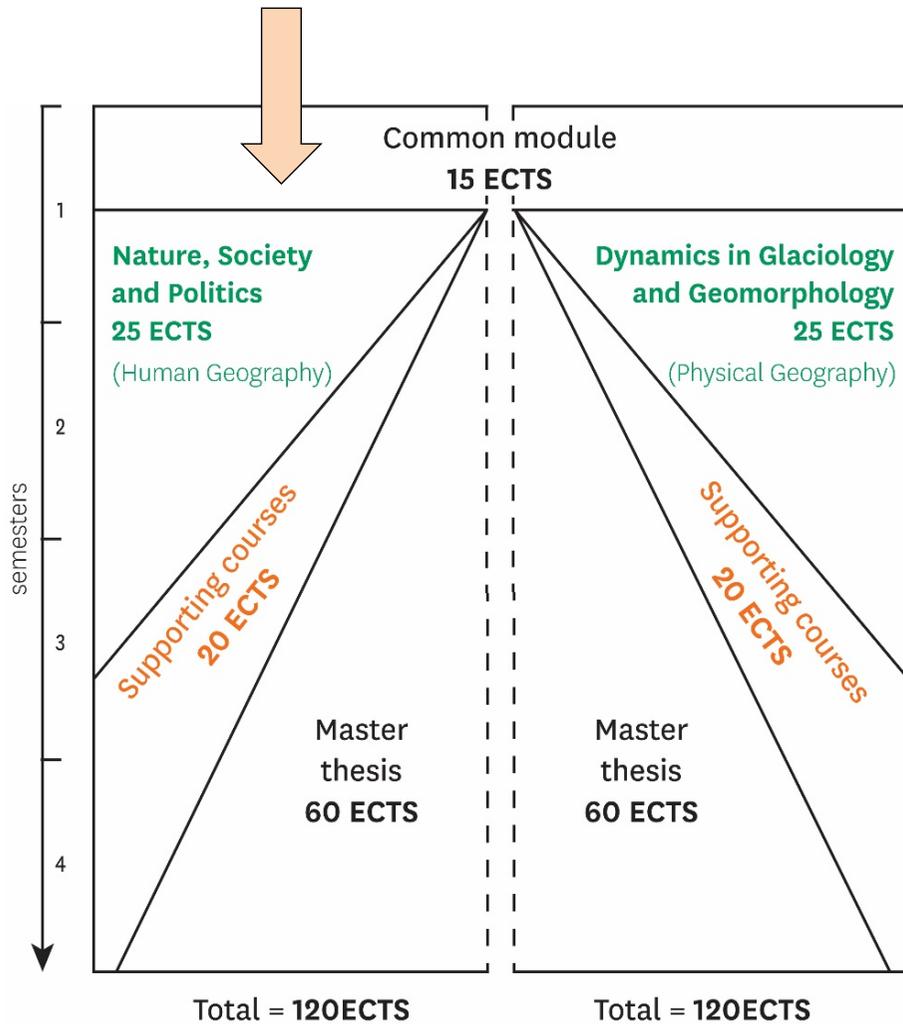
Investigates the (spatial) relations of Nature, Society and Politics

- Seminar in Social Theory
- Environmental History
- Political Ecology
- Global change, development and ethics
- Issues in Environmental ethics
- Field course

Teaching staff and researchers C. Bichsel, O. Graefe, J. Bluwstein, M. Fautras, R. Valadaud, K. Zäch, J. Zumoberhaus



# Option: Nature, Society and Politics



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29	Supporting courses				29
30	Supporting courses				30

# Political Ecology, Environmental history, Geography of Capitalism

## ▪ Example of possible MSc. research projects:

- Wilderness and wildlife conservation in Namibia
- Nature Parks: conservation or economic tool for regional development?
- Overview of rewilding initiatives in sub-Saharan Africa: history, discourse, actors, animals, geography
- NGO-driven militarized conservation in Eastern Africa: NGO- and military actors and networks
- Comparing environmental justice movements and discourses in Latin America and sub-Saharan Africa
- History of “empty spaces” in colonial, development and modernization discourses
- Natural resources – a political history of the term in environmental and geographical discourses
- Oral history for environmental history – methodological explorations on a case study in Switzerland
- Environmental justice and NGO activism in China.
- The political ecology of waste: actors, structures, and discourses.
- More topics under <https://moodle.unifr.ch/course/view.php?id=52652>

**General rules** for Master thesis [https://www.unifr.ch/scimed/fr/studies/master-\(msc\)/master-thesis.html](https://www.unifr.ch/scimed/fr/studies/master-(msc)/master-thesis.html),

# Questions?

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