

At Louvain-la-Neuve - 120 credits - 2 years - Day schedule - In FrenchDissertation/Graduation Project : **YES** - Internship : **optional**Activities in English: **YES** - Activities in other languages : **NO**Activities on other sites : **YES**Main study domain : **Sciences**Organized by: **Faculty of Science (SC)**Programme acronym: **CLIM2M** - Francophone Certification Framework: 7**Table of contents**

Introduction	2
Teaching profile	3
- Learning outcomes	3
- Programme structure	4
- Programme	4
- Detailed programme by subject	4
- Course prerequisites	8
- The programme's courses and learning outcomes	8
Information	9
- Access Requirements	9
- Supplementary classes	11
- Teaching method	12
- Evaluation	12
- Mobility and/or Internationalisation outlook	12
- Possible trainings at the end of the programme	12
- Contacts	12

CLIM2M - Introduction

Introduction

CLIM2M - Teaching profile

Learning outcomes

The objective of the training is partly an introduction to the three fundamental aspects of the work of a geographer:

- to observe and describe the environment, especially with computerized databases and advanced satellite observation technology ;
- to understand and explain the processes that have been observed, especially by applying models which enable them to be simulated;
- to learn certain concepts in resource management through land development ;

and partly an introduction to the fundamental concepts of physical climatology:

- to understand the dynamics of the atmosphere, the ocean and the overall climatological system;
- to grasp the techniques for modelling the climate, covering both theoretical and technical aspects;
- to be able to analyse and interpret climatic data.

This twin focus enables students to make a critical analysis of issues related to climate change (past and future and to understand and anticipate their impact on the environment and society so they can become responsible players in the current situation. The Master in Geography : Climatology is also suitable preparation for a doctoral thesis.

On successful completion of this programme, each student is able to :

Se préparer à la vie professionnelle

1. Intervenir dans la gestion des ressources
- 2 Evaluer des projets
- 3 Développer des outils d'aide à la décision

Modéliser les processus observés dans la réalité

Identifier les caractéristiques/composantes du système et la manière dont elles interagissent

Formuler des hypothèses/tests de travail

Développer des modèles (statistiques, numériques, conceptuels)

Tester par l'application, calibration et validation

Interpréter les résultats en lien avec la problématique

Porter un regard critique sur les méthodes utilisées

Evaluer la pertinence et la fiabilité des sources générales d'information

Identifier les limites des modèles, méthodes

Contextualiser les résultats, et coupler avec d'autres résultats

Intégrer les concepts de différentes disciplines dans une vision cohérente des ressources

Faire des liens entre différents aspects de la géographie

Analyser les interactions entre l'homme et l'environnement

Prendre en compte les apports des autres disciplines pour résoudre une problématique dans son ensemble

Synthétiser et communiquer

Communiquer oralement et par écrit en français et anglais

Communiquer à des acteurs scientifique (collègues) et acteurs de terrain

Communiquer la démarche, méthodes et résultats, discussion

Communiquer par la réalisation de schémas, de cartographie, graphiques

Se préparer à la vie professionnelle

Intervenir dans la gestion des ressources

Evaluer des projets

Développer des outils d'aide à la décision

7. Communiquer efficacement des résultats, des méthodes à différents types d'acteurs

7.1. Communiquer oralement et par écrit en français et en anglais (niveau C1).

7.2. Communiquer les résultats d'un travail à des acteurs scientifiques et des acteurs de terrain, en s'adaptant au contexte.

7.3. Communiquer de manière synthétique et critique l'état des connaissances dans un domaine donné.

7.4. Communiquer et discuter des données, des méthodes et des résultats.

7.5. Communiquer des résultats par la réalisation de cartes, de schémas et de graphiques.

7.6. Maîtriser les outils informatiques indispensables à la communication.

8. Intervenir dans la gestion des ressources et aborder la vie professionnelle

8.1. Construire un diagnostic sur un territoire et sur la gestion des ressources de ce territoire.

8.2. Evaluer des projets de développement territorial.

8.3. Développer des outils d'aide à la décision.

- 8.4. Concevoir des solutions dans le domaine de la gestion des ressources et de l'aménagement du territoire.
 8.5 Tester les solutions et évaluer les impacts suivant des objectifs de développement durable.
 9. Mobiliser les compétences nécessaires pour réaliser un travail de recherche en climatologie.
 9.1. Comprendre la dynamique de l'atmosphère, de l'océan, et du système climatologique dans son ensemble.
 9.2. Appréhender les techniques de modélisation du climat, en couvrant les aspects théoriques et techniques.
 9.3. Savoir analyser et interpréter des données climatiques.
 9.4. Mener une analyse critique sur des questions liées aux changements climatiques (passés et futurs) et en comprendre et anticiper les impacts sur la société et l'environnement de façon à devenir un acteur responsable dans le monde d'aujourd'hui.

Programme structure

The programme comprises core subjects of 60 credits, 30 credits for the focus and 30 credits for optional subjects.

For a programme-type, and regardless of the focus, options/or elective courses selected, this master will carry a minimum of 120 credits divided over two annual units, corresponding to 60 credits each.

> [Tronc commun](#) [en-prog-2021-clim2m-tronc_commun]

Liste au choix de finalités CLIM2M

> [Research Focus](#) [en-prog-2021-clim2m-lclim200a]

List of electives

> [Optional courses](#) [en-prog-2021-clim2m-lsc100a]

Preparatory Module (only for students who qualify for the course via complementary coursework)

> [Master \[120\] in Geography : Climatology](#) [en-prog-2021-clim2m-module_complementaire]

CLIM2M Programme

Detailed programme by subject

CORE COURSES [90.0]

● Mandatory

△ Courses not taught during 2021-2022

⊕ Periodic courses taught during 2021-2022

⊗ Optional

⊙ Periodic courses not taught during 2021-2022

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

						Year	
						1	2
● LGEO2110	Mondialisation, développement et environnement	Eric Lambin	30h+30h	5 Credits	q1	x	x
● LGEO2210	Shaping sustainable urban spaces	Marie-Laurence De Keersmaecker Yves Hanin	30h	3 Credits	q1	x	x
● LGEO2120	Applied geomorphology	Bas van Wesemael	30h+30h	5 Credits	q1	x	x
● LGEO2240	Tectonic geomorphology		30h+30h	5 Credits	q1 ⊙	x	x
● LGEO2230	Géographie médicale et de la santé	Sophie Vanwambeke	30h+30h	5 Credits	q1	x	x
● LGEO2140	Advanced physical geography	Kristof Van Oost Veerle Vanacker	30h+30h	5 Credits	q2 ⊕	x	x

Year

1 2

o Philosophie (2 credits)

⊗ LSC2001	Introduction to contemporary philosophy	Peter Verdée	30h	2 Credits	q2	X	X
⊗ LSC2220	Philosophy of science	Cristian Lopez (compensates) Alexandre Guay)	30h	2 Credits	q2	X	X
⊗ LFILO2003E	Ethics in the Sciences and technics (sem)	Hervé Jeanmart Charles Pence René Rezsoschazy	15h+15h	2 Credits	q2	X	X
⊗ LTHEO2840	Science and Christian faith	Benoît Bourguine Dominique Lambert	15h	2 Credits	q1	X	X

o Mémoire (30 credits)

o LCLIM2999	Mémoire			22 Credits	q2		X
o LGEO2997	Séminaire d'encadrement du mémoire	Bas van Wesemael	15h	5 Credits	q1	X	
o LGEO2998	Thesis tutorial	Bas van Wesemael	15h	3 Credits	q2		X

o Cours au choix (30 credits)

o Climatologie et sciences de la terre

L'étudiant-e choisit minimum 10 crédits parmi les cours ci-dessous :

⊗ LENVI2005	Changements climatiques: impacts et solutions	Yannick Agnan (compensates) Pierre Delmelle) Philippe Marbaix Jean-Pascal van Ypersele de Strihou (coord.)	30h	3 Credits	q2	X	X
⊗ LPHYS2161	Internal geophysics of the Earth and planets	Nicolas Bergeot Véronique Dehant	22.5h +7.5h	5 Credits	q1	X	X
⊗ LPHYS2260	Geodesy and GNSS (Global Navigation Satellite System)	Nicolas Bergeot Véronique Dehant	30h	5 Credits	q2 ⊕	X	X
⊗ LPHYS2264	Atmospheric and oceanic waves and instabilities	Michel Crucifix	30h	5 Credits	q2 ⊕	X	X
⊗ LPHYS2265	Sea ice-ocean-atmosphere interactions in polar regions	Thierry Fichet	30h	5 Credits	q2 ⊗	X	X
⊗ LPHYS2266	Physics of the upper atmosphere and space	Viviane Pierrard	22.5h +7.5h	5 Credits	q2	X	X
⊗ LPHYS2267	Paleoclimate dynamics and modelling	Qiuzhen Yin	22.5h +7.5h	5 Credits	q2	X	X
⊗ LPHYS2269	Remote sensing of climate change	Emmanuel Dekemper	30h	5 Credits	q2 ⊗	X	X
⊗ LULBG2400	Le système Terre et ses interactions (ULB)			4 Credits		X	X
⊗ LULBG2408	Modélisation en géographie physique (ULB)			2 Credits		X	X
⊗ LULBG2410	Les changements climatiques des derniers 100000 ans (ULB)			6 Credits		X	X
⊗ LCLIM2280	Operational meteorology			8 Credits	q2	X	X

o Choix parmi les cours de géographie

⊗ LCLIM2270	Field in climatology 2	Bas van Wesemael	60h+30h	4 Credits	q2 ⊗	X	X
⊗ LECON2314	Economic Geography	Joseph Gomes	30h	5 Credits	q2	X	X
⊗ LGEO1242	Cartographic projections and geodesy	Jean-Pascal van Ypersele de Strihou	30h+15h	4 Credits	q2	X	X
⊗ LGEO1321	Human and Economic geography 1	Patrick Meyfroidt Sophie Vanwambeke	22.5h +22.5h	4 Credits	q2	X	X
⊗ LGEO1322	Human and economic geography 2	Marie-Laurence De Keersmaecker	22.5h +15h	4 Credits	q1	X	X
⊗ LGEO1323	Economic geography	Justin Delloye	22.5h +15h	4 Credits	q1	X	X
⊗ LGEO1331	Geomorphology	Bas van Wesemael	30h+30h	5 Credits	q2	X	X
⊗ LGEO1332	Biogeography	Caroline Nieberding Renate Wesselingh	30h+24h	5 Credits	q2	X	X

							Year	
							1	2
✘ LGEO2185	Advanced geo-processing	Kristof Van Oost	30h+30h	5 Credits	q2	x	x	
✘ LGEO2211	Advanced statistical methods in geography	Christian Hafner	30h+30h	5 Credits	q1	x	x	
✘ LGEO2250	Mesures de terrain en géographie	Kristof Van Oost	30h+30h	5 Credits	q2	x	x	
✘ LGEO2400	Internship in a professional setting		15h	4 Credits	q1 or q2	x	x	
✘ LPHY1365	Meteorology	Michel Crucifix Thierry Fichet	37.5h +22.5h	5 Credits	q2	x	x	

RESEARCH FOCUS [30.0]

○ Mandatory

△ Courses not taught during 2021-2022

⊕ Periodic courses taught during 2021-2022

⊗ Optional

⊖ Periodic courses not taught during 2021-2022

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

Year

1 2

o Content:**o Terrain en géographie (4 credits)**

L'étudiant-e choisit au moins un terrain parmi :

⊗ LCLIM2170	Field in climatology 1	Veerle Vanacker	60h+30h	4 Credits	q2 ⊕	x	x
⊗ LCLIM2270	Field in climatology 2	Bas van Wesemael	60h+30h	4 Credits	q2 ⊖	x	x
○ LPHYS2163	Atmosphere and ocean : physics and dynamics	Thierry Fichet François Massonnet	52.5h +7.5h	10 Credits	q1	x	
○ LGEO2290	Travaux dirigés de modélisation climatique	Pierre-Yves Barriat Qiuzhen Yin	15h	2 Credits	q1	x	
○ LPHYS2162	Introduction to the physics of the climate system and its modelling	Hugues Gosse Jean-Pascal van Ypersele de Strihou	22.5h +22.5h	5 Credits	q1	x	

o Cours au choix (3 credits)

L'étudiant-e choisit 9 crédits (5 crédits si l'étudiant a suivi LCLIM 2170 et 2270) dans la liste ci-dessous :

⊗ LENVI2005	Changements climatiques: impacts et solutions	Yannick Agnan (compensates Pierre Delmelle) Philippe Marbaix Jean-Pascal van Ypersele de Strihou (coord.)	30h	3 Credits	q2	x	x
⊗ LCLIM2010	Modélisation du climat: Atmosphère (modèle MAR) (ULG - CLIM0017-2 - Partim 1) ■		10h+20h	3 Credits	q1	x	x
⊗ LCLIM2011	Modélisation du climat: Végétation et cycle du carbone (modèle CARAIB) (ULG - CLIM0017-2 - Partim 2) ■		15h+25h	3 Credits	q1	x	x
⊗ LCLIM2020	Gaz à effet de serre et lutte contre les changements climatiques (ULG-CLIM0007-2)		30h	3 Credits	q1	x	x
⊗ LPHYS2268	Forecast, prediction and projection in climate science	François Massonnet	22.5h +7.5h	5 Credits	q2	x	x

Optional courses

OPTIONAL COURSES

- Mandatory
 △ Courses not taught during 2021-2022
 ⊕ Periodic courses taught during 2021-2022
- ☒ Optional
 ⊖ Periodic courses not taught during 2021-2022
 ■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

These credits are not counted within the 120 required credits.

Year

1 2

o Content:

☒ LSST1001	IngénieursSud	Stéphanie Merle Jean-Pierre Raskin (coord.)	15h+45h	5 Credits	q1+q2	x	x
☒ LSST1002M	Information and critical thinking - MOOC	Myriam De Kesel Jean-François Rees	30h+15h	3 Credits	q2	x	x

Course prerequisites

The **table** below lists the activities (course units, or CUs) for which there are one or more prerequisites within the programme, i.e. the programme CU for which the learning outcomes must be certified and the corresponding credits awarded by the jury before registering for that CU.

These activities are also identified **in the detailed programme**: their title is followed by a yellow square.

Prerequisites and student's annual programme

As the prerequisite is for CU registration purposes only, there are no prerequisites within a programme year. Prerequisites are defined between CUs of different years and therefore influence the order in which the student will be able to register for the programme's CUs.

In addition, when the jury validates a student's individual programme at the beginning of the year, it ensures its coherence, meaning that it may:

- transform a prerequisite into a corequisite within the same year (to enable the student to continue his or her studies with a sufficient annual course load)
- require the student to combine registration in two separate CUs which it considers necessary from a pedagogical point of view.

For more information, please consult the [Academic Regulations and Procedures](#).

Prerequisites list

LCLIM2010 "Modélisation du climat: Atmosphère (modèle MAR) (ULG - CLIM0017-2 - Partim 1)" has prerequisite(s) LGEO2290

- LGEO2290 - Travaux dirigés de modélisation climatique

LCLIM2011 "Modélisation du climat: Végétation et cycle du carbone (modèle CARAIB) (ULG - CLIM0017-2 - Partim 2)" has prerequisite(s) LGEO2290

- LGEO2290 - Travaux dirigés de modélisation climatique

The programme's courses and learning outcomes

For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies the skills expected of every graduate on completion of the programme. Course unit descriptions specify targeted learning outcomes, as well as the unit's contribution to reference framework of learning outcomes.

CLIM2M - Information

Access Requirements

Master course admission requirements are defined by the French Community of Belgium Decree of 7 November 2013 defining the higher education landscape and the academic organisation of courses.

General and specific admission requirements for this programme must be satisfied at the time of enrolling at the university.

In the event of the divergence between the different linguistic versions of the present conditions, the French version shall prevail.

SUMMARY

- > [General access requirements](#)
- > [Specific access requirements](#)
- > [University Bachelors](#)
- > [Non university Bachelors](#)
- > [Holders of a 2nd cycle University degree](#)
- > [Holders of a non-University 2nd cycle degree](#)
- > [Access based on validation of professional experience](#)
- > [Access based on application](#)
- > [Admission and Enrolment Procedures for general registration](#)

Specific access requirements

In addition to the access conditions described below, candidates will have to provide proof of a sufficient command of the French language (level B1 of the CEFR, Common European Framework of Reference for Languages).

Students who wish to be admitted on the basis of a dossier (see tables below) are invited to consult the [criteria for the evaluation of application](#).

University Bachelors

Diploma	Special Requirements	Access	Remarks
UCLouvain Bachelors			
Bachelor in Geography : General		Direct access	
Bachelor in Physics	Si l'étudiant a suivi la Minor in Geography	Direct access	In some cases, the UCLouvain Enrolment Office, after reviewing their online enrolment or re-enrolment application, will ask the students concerned to provide an enrolment authorisation from the faculty/ school.
Bachelor in Bioengineering		Direct access	
Others Bachelors of the French speaking Community of Belgium			
Tous les bacheliers de la CfB		Direct access	
Bachelors of the Dutch speaking Community of Belgium			
		Direct access	
Foreign Bachelors			
		Access based on application	

Non university Bachelors

> Find out more about [links](#) to the university

Diploma	Access	Remarks
---------	--------	---------

BA en agronomie (techniques et gestion agricoles) - EPS - crédits supplémentaires entre 45 et 60
 BA en agronomie (toutes orientations) - HE - crédits supplémentaires entre 45 et 60

Les enseignements supplémentaires éventuels peuvent être consultés dans le [module complémentaire](#).

Type court

Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			
Licence en sciences géographiques		Direct access	Ces étudiants ont directement accès à la deuxième année de master avec éventuellement un programme adapté.
Masters			
Tous les masters		Access with additional training	

Holders of a non-University 2nd cycle degree

Access based on validation of professional experience

> It is possible, under certain conditions, to use one's personal and professional experience to enter a university course without having the required qualifications. However, validation of prior experience does not automatically apply to all courses. Find out more about [Validation of priori experience](#).

Accès selon la procédure de validation des acquis de l'expérience
 Consultez le site www.uclouvain.be/vae

Access based on application

Admission on the basis of a submitted dossier may be granted either directly or on the condition of completing additional coursework of a maximum of 60 ECTS credits, or refused.

The first step in the procedure is to submit a file online (see <https://uclouvain.be/en/study/inscriptions/futurs-etudiants.html>).
 Students who wish to be admitted on the basis of a dossier are invited to consult the [criteria for the evaluation of application](#).

Admission and Enrolment Procedures for general registration

Supplementary classes

To access this Master, students must have a good command of certain subjects. If this is not the case, they must add supplementary classes at the beginning of their Master's programme in order to obtain the prerequisites for these studies.

● Mandatory

△ Courses not taught during 2021-2022

⊕ Periodic courses taught during 2021-2022

⊗ Optional

⊖ Periodic courses not taught during 2021-2022

■ Activity with requisites

Click on the course title to see detailed informations (objectives, methods, evaluation...)

○ Enseignements supplémentaires

Teaching method

The teaching strategy takes its inspiration from the idea of "taking responsibility for one's own learning" and offers a wide range of learning situations. The climatologist is at the centre of different scientific fields: physical modeling, teledetection, hydrology and the management of natural resources. The integration between human and physical geography is emphasized. The courses are focused on problems in society: environmental changes, mobility, urbanization, globalization and developing countries. Activities such as seminars and integrated exercises are carried out in advanced areas of geographical research. Ability to use advanced methods of geographical analysis is an important objective of the training: geographical modeling, geographical information systems and satellite teledetection.

Practical work gives students the opportunity of dealing with concrete problems and finding solutions to them, often in small groups. The Master in Climatology is notable for the multidisciplinary background of the teaching staff. Studies will study with lecturers in geography and physics. Activities such as seminars and integrated exercises are designed so that students progressively encounter the complexity of the climatic system. Students in the last year of the Master should therefore be able to use and understand professional climatic modelling systems.

The computer rooms with special software for geographical analysis are always open to students. In the first year of the Master, the field work consists of a week of supervised exercises in the Alps or Spain.

Evaluation

The evaluation methods comply with the [regulations concerning studies and exams](#). More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".

Students will mainly be assessed on the basis of individual work (e.g. reading, consultation of databases and bibliographic references, writing monographs and reports, presentation of seminars, dissertation and work placement). Where necessary, students will also be assessed on how much they have learned from lectures. As far as possible, there will be continuous assessment, including regular 'open book examinations'. Certain activities will not be given a precise mark but will be officially certified. Assessment of the dissertation is in two stages : a 'progress report' at the end of the first year of the Master and the final presentation.

Mobility and/or Internationalisation outlook

La mobilité des étudiants est fortement encouragée, soit par un échange Erasmus ou Mercator hors Belgique, soit à la KULeuven. Ce séjour se fera durant le 2ème quadrimestre du premier master.

La possibilité sera donnée de suivre des cours en anglais. Ceci permettra non seulement aux étudiants de l'UCL de se familiariser mieux encore avec cette langue, mais aussi aux étudiants Erasmus venant de l'étranger de suivre un semestre de cours en anglais.

Des cours approfondis sont donnés par des professeurs visiteurs venant de diverses Institutions belges mais surtout étrangères. Ces enseignements sont parfois dispensés en anglais.

Possible trainings at the end of the programme

The Master in Geography : Climatology gives direct access to a doctorate in science.

Contacts

Curriculum Management

Entity

Structure entity

Denomination

Faculty

Sector

Acronym

Postal address

SST/SC/GEOG

(GEOG)

Faculty of Science (SC)

Sciences and Technology (SST)

GEOG

Place Louis Pasteur 3 - bte L4.03.07

1348 Louvain-la-Neuve

Tel: [+32 \(0\) 10 47 28 73](tel:+322472873) - Fax: [+32 \(0\) 10 47 28 77](tel:+322472877)

Website

<https://uclouvain.be/fr/facultes/sc/geo>

Academic supervisor: [Marie-Laurence De Keersmaecker](#)

Jury

- President: [Marie-Laurence De Keersmaecker](#)
- Secretary and study advisor: [Bas van Wesemael](#)

Useful Contact(s)

- Administrative manager for the student's annual program: [Aloysia Stephenne](#)
- Secretary of the School of geography: [Catherine De Roy](#)

