



o Formation spécialisée en physique (30 crédits)

NB : Des programmes types en fonction des orientations de la recherche en sciences physiques à l'UCLouvain sont proposés sur le site Web de l'école de physique. L'étudiant-e choisit 30 crédits parmi les UE ci-dessous (les UE LPHYS2143 et LPHYS2102 sont vivement conseillées pour les étudiant-e-s inscrit-e-s à la finalité spécialisée) :

⌘ Physique statistique et mathématique

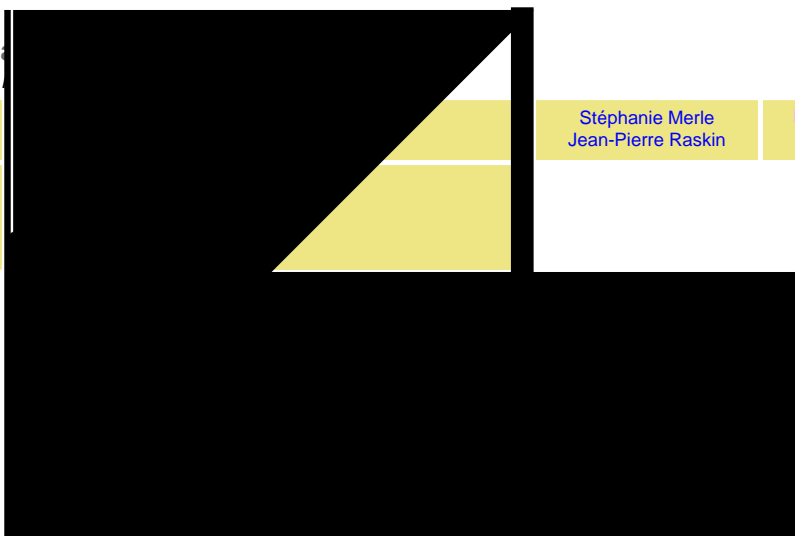
⌘ LPHYS2112	Mathematical physics	Christophe Ringeval	EN [q1] [30h] [5 Credits]  > French-friendly	X	
⌘ LPHYS2113	Critical phenomena	Philippe Ruelle	EN [q1] [22.5h+7.5h] [5 Credits]  > French-friendly	X	

				Year	
				1	2
⊗ LSC2001	Introduction to contemporary philosophy	Peter Verdée Peter Verdée (compensates Charles Pence)	EN [q2] [30h] [2 Credits]	x	x
⊗ LSC2220	Philosophy of science	Alexandre Guay	EN [q2] [30h] [2 Credits]	x	x
⊗ LFILO2003E	Ethics in the Sciences and technics (sem)	Alexandre Guay (compensates Charles Pence) Hervé Jeanmart René Rezsöházy	EN [q2] [15h+15h] [2 Credits]	x	x
⊗ LTHEO2840	Science and Christian faith	Benoît Bourguine Paulo Jorge Dos Santos Rodrigues	EN [q1] [15h] [2 Credits]	x	x

⊗ **Formation f**

These credits are

⊗ LSST1001	[REDACTED]	Stéphanie Merle Jean-Pierre Raskin	EN [q1+q2] [15h+45h] [5 Credits]	x	x
⊗ LSST1002M					



LIST OF FOCUSES

- > Research Focus [en-prog-2024-phys2m-lphys200a]
- > Teaching Focus [en-prog-2024-phys2m-lphys200d]

RESEARCH FOCUS [30.0]

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊖ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

Year

1 2

o Content:

⊗ Physique statistique et mathématique

⊗ LPHYS2211	Group theory	Philippe Ruelle	EN [q2] [22.5h+22.5h] [5 Credits] 🌐 > French-friendly	X	
⊗ LPHYS2215	Statistical field theory	Christian Walmsley Hagendorf	EN [q2] [30h] [5 Credits] ⊕ 🌐 > French-friendly	X	X

⊗ Gravitation, cosmologie et astroparticules

⊗ LPHYS2221	Astrophysics and astroparticles	Gwenhaël de Wasseige	EN [q2] [30h] [5 Credits] 🌐 > French-friendly	X	
⊗ LPHYS2223	utrino physics and dark matter	Marco Drewes	EN [q2] [30h] [5 Credits] 🌐 > French-friendly	X	
⊗ LPHYS2224	Advanced cosmology and general relativity	Christophe Ringeval	EN [q1] [30h] [5 Credits] 🌐 > French-friendly		X

⊗ Physique des particules

LPHYS2233A, LPHYS2233B and LPHYS2233C cannot be taken if the full course LPHYS2233 is selected .

⊗ LPHYS2233	Experimental methods in fundamental physics	Agni Bethani (compensates Eduardo Cortina Gil) Giacomo Bruno Eduardo Cortina Gil	EN [q2] [52.5h+7.5h] [10 Credits] 🌐 > French-friendly	X	
⊗ LPHYS2233A	Experimental methods in fundamental physics - Introduction and use of GEANT	Agni Bethani (compensates Eduardo Cortina Gil) Giacomo Bruno	EN [q2] [22.5h+7.5h] [4 Credits] 🌐 > French-friendly	X	
⊗ LPHYS2233B	Experimental methods in fundamental physics - Advanced detection methods	Agni Bethani (compensates Eduardo Cortina Gil) Giacomo Bruno	EN [q2] [25h+5h] [5 Credits] 🌐	X	
⊗ LPHYS2233C	Experimental methods in fundamental physics - Data analysis	Agni Bethani (compensates Eduardo Cortina Gil) Giacomo Bruno	EN [q2] [27.5h+2.5h] [5 Credits] 🌐	X	
⊗ LPHYS2234					

TEACHING FOCUS [30.0]

IMPORTANT NOTE: In accordance with article 138 para. 4 of the decree of 7 November 2013 concerning higher education and the academic organisation of studies, teaching practice placements will not be assessed in the September session. Students are required to make every effort to successfully complete the teaching practice in the June session, subject to having to retake the year.

- Mandatory
- ⊗ Optional
- △ Not offered in 2024-2025
- ⊖ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

Year

- o **Module animer un groupe et travailler en équipe**

				Year	
				1	2
⊗ LGBIO1111	Cell biology and physiology	Charles De Smet Laurent Jacques Pascal Kienlen-Campard	EB [q2] [30h+15h] [5 Credits]	x	x
⊗ LGBIO1112	Introduction to biomedical engineering	Benoit Delhaye (compensates Philippe Lefèvre) Sophie Demoustier (compensates Philippe Lefèvre) Greet Kerckhofs (compensates Philippe Lefèvre)	EB [q2] [45h] [5 Credits]	x	x

⊗ **Optional courses :**

These credits are not counted within the 120 required credits.

⊗ LSST1001	IngénieursSud	Stéphanie Merle Jean-Pierre Raskin	EB [q1+q2] [15h+45h] [5 Credits]	x	x
⊗ LSST1002M	Information and critical thinking - MOOC	Anne Bauwens (compensates Jean- François Rees) Myriam De Kesel	EB [q2] [30h+15h] [3 Credits]	x	x

Supplementary classes

To access this Master, students must have a good command of certain subjects. If this is not the case, in the first annual block of their Masters programme, students must take supplementary classes chosen by the faculty to satisfy course prerequisites.

These additional teaching units (maximum 60 credits) will be selected in the programme of the second and third annual units of the Bachelor's degree in physics, in consultation with the Study advisor, depending on the previous teaching units followed by the student and his/her training project, and will be submitted to the approval of the School of Physics.

- Mandatory
- ✂ Optional
- △ Not offered in 2024-2025
- ⊙ Not offered in 2024-2025 but offered the following year
- ⊕ Offered in 2024-2025 but not the following year
- △ ⊕ Not offered in 2024-2025 or the following year
- Activity with requisites
- 🌐 Open to incoming exchange students
- 🚫 Not open to incoming exchange students
- [FR] Teaching language (FR, EN, ES, NL, DE, ...)

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

o Enseignements supplémentaires

Course prerequisites

There are no prerequisites between course units (CUs) for this programme, i.e. the programme activity (course unit, CU) whose learning outcomes are to be certified and the corresponding credits awarded by the jury before registration in another CU.

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

authorisation from the faculty/
school.

Others Bachelors of the French speaking Community of Belgium

Direct access

Bachelier en sciences de l'ingénieur, orientation ingénieur civil

[Access based on application](#)

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

Holders of a 2nd cycle University degree

Diploma

Specific professional rules

Successful completion of the master's course with **teaching focus** leads to the award of the master's degree with teaching focus and the title of secondary school education specialist.

The [Réforme des Titres et Fonctions](#) ("Titles and Functions Reform"), in force since 1 September 2016, is intended to harmonise the titles, functions and pay scales of basic and secondary education professionals in French Community of Belgium networks.

It also aims to guarantee the priority of preferred titles over minimum titles and to establish a regime for titles in short supply.

AESS holders can learn which functions they can carry out and the pay scales from which they can benefit by [clicking here](#).

The university cannot be held responsible for any problems that students may encounter at a later date with a view to a teaching appointment in the French Community of Belgium.

Teaching method

Most teaching units are given by default in English.

Various teaching methods are used : lectures, flipped classroom, project-based learning, etc. Exercise and practical lab sessions are organized for certain teaching units. Individual or group projects are planned for most of the teaching units. These projects play a significant role (around 20%) in the final grade.

Almost all teaching units have a website on the MoodleUCL platform. Useful information is provided, as well as syllabi and other documents essential to student's work.

The Master's thesis is a formative activity that must lead students to demonstrate their ability to (1) deal in depth with a physical problem in all its real complexity, by conducting a personal research, under the direction of a promoter, and (2) write a summary of his/her work and defend it in public in a rigorous and educational way, while being able to answer relatively specific questions. The various stages are : constitution of a relevant bibliography on the subject, reading and understanding of the selected articles, implementation and execution of the project, analysis and interpretation of the results obtained, writing of a synthesis manuscript and oral presentation of the latter. To carry out this project, the student is embedded in a research group with which he/she can interact.

A "thesis tutorial" introduces the student to scientific communication and, in particular, to the oral presentation of a scientific subject in English.

The physics seminar is composed of three series of presentations to which students must attend : lectures of general interest, more specific seminars dealing with physics research carried out in UCLouvain research institutes and testimonials from former students on their professional background.

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".

The evaluation methods are in accordance with the regulations for studies and examinations. More details on the terms and conditions specific to each teaching unit are available in their fact sheet under the heading "Assessment of student achievement".

The student is evaluated on the basis of the personal work that he/she will have accomplished (readings, consultation of databases and bibliographical references, writing of monographs and reports, presentation of seminars, dissertation, etc.). When the training requires it, the student is also evaluated regarding his/her ability to assimilate the masterly taught subject. The evaluation of the Master's thesis is based on the work performed during the year and its written and oral presentation.

To obtain the average, the marks obtained for the different teaching units are weighted by their respective credits.

If a student enrolled in an exam at the January session has not been able to present the examination for reasons of force majeure which are duly justified, he/she may ask the President of the Jury for permission to present the examination at the June session. The President of the Jury judges the relevance of the application and, if the course owner agrees, may authorize the student to present the examination at the June session.

Mobility and/or Internationalisation outlook

Most teaching units are given by default in English.

Students who have chosen the research focus are encouraged to study abroad outside the Wallonia-Brussels Federation within the framework of a Socrates/Erasmus agreement or equivalent (Mercator, Erasmus Belgica), preferably during the second semester of the first annual unit or the first semester of the second annual unit. This study stay will consist of following several teaching units proposed by the host university, for a maximum of 30 credits, and/or preparing the Master's thesis. For a list of Belgian and foreign universities

Possible trainings at the end of the programme

Whatever the focus chosen, the Master's [120] degree gives direct access to the PhD in Science.

In addition, there are two particularly adapted programmes that allow for further study and obtaining specific diplomas :

1) An additional year of study at Mol, after the Master's [120] degree, allows to follow the English-speaking interuniversity programme giving the title of "Master in Nuclear Engineering" managed by BNEN (Belgian Nuclear Higher Education Network) (intensive courses

