





## FYAP2M - Teaching profile

### Learning outcomes

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Physical engineers master the physical aspects of how objects function and their interaction with the environment (waves, light, ions, electric and magnetic fields, temperature gradients). Physical engineers have dual training in experiments and simulation. They are capable of using theories and formal representations of objects thanks to numerical simulation tools. They are also capable of carrying out laboratory-based experiments. Their comprehensive understanding of physical properties allows them to make the connection between properties on an atomic scale with those that are macroscopic.

Due to the in-depth study of different fields of physics (material physics, optics, electromagnetics, electronics, mechanics, quantum physics, etc.), the Master's degree programme in physical engineering (FYAP) prepares students for numerous jobs and specialisations in the industrial sector as well as participation in research-based technological activities.

Physical engineers are called on to resolve technological problems that are often complex and multidisciplinary in nature, linked to the design and creation of materials, devices and systems. They can act as an interface between different professions that use functional materials. They are called on to innovate in a specific technological environment.




Physical engineers systematically take into account constraints, values, rules (both legal and ethical) and economics. Their solid scientific background allows them to be autonomous enough to manage complex industrial projects. They are comfortable working as part of a team and communicating effectively even in English.

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

1. Demonstrating their mastery of a solid body of knowledge in basic engineering sciences allowing them to understand and solve problems related to technological and industrial applications in the physical sciences.

1.1 Identify and use concepts, laws, and appropriate reasoning to solve a given problem (for example, identifying laws and materials to



				Year	
				1	2
<p>○ LEPL2020</p>	<p><b>Professional integration work</b></p> <p><i>The modules of LEPL2020 course are organized over the two annual blocks of the master's degree. It is strongly recommended that students take them from year 1, but they will only be able to register for the course at the earliest the year in which they present their final graduation project.</i></p> <p><i>Students who have other professional integration activities in their personal programme, or who can demonstrate an equivalent activity could be exempted from this course. This equivalence is at the discretion of the examination board. Another activity should then be chosen to reach the number of ECTS required for their graduation.</i></p>		<p>EN [q1+q2] [30h+15h] [2 Credits]  </p> <p>&gt; <i>French-friendly</i></p>	x	x
<p>○ LELEC1755</p>	<p><b>Physics of electronic devices and transmission lines</b></p>	<p>Denis Flandre (coord.) Claude Oestges</p>	<p>EN [q1] [30h+30h] [5 Credits] </p>	x	

## PROFESSIONAL FOCUS [30.0]

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- 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]



Dans la rubrique "Options du master ingénieur civil physicien", l'étudiant-e doit valider au moins une des options proposées.  
 Dans la rubrique "Options et cours au choix en connaissances socioéconomiques", l'étudiant-e valide une des deux options ou choisit obligatoirement au minimum 3 crédits parmi les cours au choix ou les cours de l'option en enjeux de l'entreprise.

Majors for the Master's degree in physics

- > [Major in Advanced Engineering Physics](#) [ en-prog-2024-fyap2m-lfyap221o ]
- > [Major in nanotechnology](#) [ en-prog-2024-fyap2m-lfyap225o ]
- > [Major advanced electronic materials and devices](#) [ en-prog-2024-fyap2m-lfyap223o ]

Options et cours au choix en connaissances socio-économiques

- > [Business risks and opportunities](#) [ en-prog-2024-fyap2m-lfyap230o ]
- > [Major in Interdisciplinary Program in Entrepreneurship - INEO](#) [ en-prog-2024-fyap2m-lfyap231o ]
- > [Cours au choix en connaissances socio-économiques](#) [ en-prog-2024-fyap2m-lfyap200o ]

Others elective courses

- > [Others elective courses](#) [ en-prog-2024-fyap2m-lfyap952o ]

**MAJORS FOR THE MASTER'S DEGREE IN PHYSICS**

**MAJOR IN ADVANCED ENGINEERING 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...)

From 20 to 30credit(s)

Year

1 2

**o Content:**

⌘ Optics and photonics

⌘ LPHYS2141	<a href="#">Introduction to quantum optics</a>	Matthieu Génévriez Xavier Urbain	EN [q1] [22.5h+7.5h] [5 Credits] 🌐 > French-friendly	X	X
⌘ LPHYS2246	<a href="#">Experimental methods in atomic and molecular physics</a>		EN [q2] [30h] [5 Credits] 🌐 > French-friendly	X	X

⌘ Experimental methods

⌘ Numerical simulations

⌘ LMAPR2483	Durability of materials	Laurent Delannay Thomas Pardoën	EN [q2] [30h+22.5h] [5 Credits]  > French-friendly
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***MAJOR IN NANOTECHNOLOGY***

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**OPTIONS ET COURS AU CHOIX EN CONNAISSANCES SOCIO-ÉCONOMIQUES**  
**[3.0]**

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**BUSINESS RISKS AND OPPORTUNITIES**

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- 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
  - 🌐
-







## Course prerequisites

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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

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For each UCLouvain training programme, a [reference framework of learning outcomes](#) specifies the 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.

## FYAP2M - 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.

Unless explicitly mentioned, the bachelor's, master's and licentiate degrees listed in this table or on this page are to be understood as those issued by an institution of the French, Flemish or German-speaking Community, or by the Royal Military Academy.

**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

This programme is taught in English with no prerequisite in French. A certificate is required for the holders of a non-Belgian degree, see selection criteria of the Access on the file.

#### University Bachelors

Diploma	Special Requirements	Access	Remarks
<b>UCLouvain Bachelors</b>			
<a href="#">Bachelor in Engineering</a>		Direct access	Students who have neither major nor minor in the field of their civil engineering Master's degree may have an adapted programme.
<b>Others Bachelors of the French speaking Community of Belgium</b>			
Bachelor in Engineering		Direct access	Students with a Bachelor's degree in engineering sciences who have not taken the equivalent of a minor in the field of their civil engineering master degree may have an adapted master programme.
<b>Bachelors of the Dutch speaking Community of Belgium</b>			
Bachelor in engineering		Access with additional training	Students who have no specialisation in the field of their civil engineering master degree may have an adapted master programme with up to 60 additional credits.
<b>Foreign Bachelors</b>			
Bachelor in engineering	Bachelors degree of Cluster Institution	Direct access	Students with a Bachelor's degree in engineering sciences who have not taken the equivalent of a minor in the field of their civil engineering master



Bachelor in Engineering	For others institutions	Access based on application	degree may have an adapted master programme. See <a href="#">personalized access</a>
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## Non university Bachelors

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

## Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			

### Masters

Master in engineering	Direct access
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## 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](#).

### Access based on application

Access based on application : access may be granted either directly or on the condition of completing additional courses of a maximum of 60 ECTS credits, or refused.

The first step of the admission procedure requires to submit an application online: <https://uclouvain.be/en/study/inscriptions/futurs-etudiants.html>

[Selection criteria are summarized here](#) (contact : [epl-admission@uclouvain.be](mailto:epl-admission@uclouvain.be)).

## Admission and Enrolment Procedures for general registration

## Teaching method

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### **Methods that promote multidisciplinary studies**

The Master's degree programme in physical engineering is interdisciplinary because acts as an interface between physics and materials science. Its versatile foundation exposes students to the wide scope of applied physics from practical training and cutting edge research

## Possible trainings at the end of the programme

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### Master's degree programmes

The [Advanced Master in Nanotechnologies](#) and the [Advanced Master in Nuclear Engineering](#) of the M.A. in physical engineering.

### Doctoral degree programmes

The Master's degree programme in physical engineering prepares students for doctoral programmes. The programme's professors are members of the MAIN ("Materials, Interfaces and Nanotechnology) doctoral programme and interested students are welcome to pursue a doctoral degree.

### UCLouvain Master's degrees (about 60) are accessible to UCLouvain Master's degree holders

For example:

- Different Master's degree programmes in management (automatic admission based on written application).
- The [Master \[60\] in Information and Communication](#) at Louvain-la-Neuve or the [Master \[60\] in Information and Communication](#) at Mons

## Contacts

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### Curriculum Management

Entity

Structure entity

Denomination

Faculty

Sector

Acronym

Postal address

SST/EPL/FYKI

(FYKI)

Louvain School of Engineering (EPL)

Sciences and Technology (SST)

FYKI

Place Sainte Barbe 2 - bte L5.02.02

1348 Louvain-la-Neuve

Tel: [+32 \(0\) 10 47 24 87](tel:+322472487) - Fax: [+32 \(0\) 10 47 40 28](tel:+322474028)

Academic supervisor: [Pascal Jacques](#)

Jury

- Président du Jury: [Claude Oestges](#)
- Secrétaire du Jury: [Pascal Jacques](#)

