



The version you're consulting is not definitive. This programme still may change. The final version will be published on 1th June.

**Autre site - 60 credits - 1 year - Day schedule - In English**

Dissertation/Graduation Project : **YES** - Internship : **YES**

Activities in English: **YES** - Activities in other languages : **NO**

Activities on other sites : **YES**

Main study domain : **Sciences de l'ingénieur et technologie**

Organized by: **Louvain School of Engineering (EPL)**

Programme acronym: **GNUC2MC** - Francophone Certification Framework: 7

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## GNUC2MC - Introduction

### Introduction

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#### Introduction

**ATTENTION** : Register for this programme through the institution responsible for its administrative management, i.e. [ULB](#), not through the UCLouvain Enrolment Office.

The master offers:

- the possibility of acquiring the skills necessary for designing and operating electronuclear power plants;
- a specialisation in nuclear sciences and technologies;
- the skills necessary for understanding the functioning of today's reactors and those of the 4th generation;
- a training organised by six universities and the Belgian Nuclear Research Centre and recognised on the European level.

#### Your profile

This programme is open if you are a:

- Belgian civil engineering graduate;
- polytechnical civil engineering graduate from the Royal Military School in Brussels;
- graduate in exact sciences and applied sciences: on file.

#### Your programme

This programme is composed of a common core of 56 credits and 4 complementary credits to be chosen from amongst the advanced seminars whose organisation varies annually as a function of the high-level scientific experts present at the Research Centre in Mol.

## GNUC2MC - Teaching profile

### Learning outcomes

The objective of the Complementary Master<sup>â€™</sup>s course in Nuclear Engineering is to enable students to acquire the high level skills needed to design and run electro-nuclear power stations, taking into account the legal prescriptions and regulations relating to the safety of these plants. In a wider perspective, to enable students to acquire a university-level specialisation in nuclear science and technology which is recognised at the European level

### Programme structure

This program comprises a core curriculum of 56 credits and 4 complementary credits to be chosen from the advanced seminars, the organisation of which varies from year to year in function of the high level scientific skills present at the Research Centre in Mol. By way of example, the following seminars were organised in recent years:

- Advanced seminar on accelerators and time of flight experiments
- Radioisotopes
- Safeguards
- Nuclear energy, future prospects
- Electricity, energy vector of the future
- Recycling of previously radioactive material
- Emergency Planning
- Experience with full scale MCNP modeling of research reactors
- Minimising waste production in a complex nuclear center : from conception to the decommissioning, the SCK.CEN reference case.

This program is set out in detail on the website of SCK.CEN à Mol at the address : <https://www.sckcen.be/en/sck-cen-academy/training-courses/academic-education>

Core curriculum of the Complementary Master in Nuclear Engineering

Electives of the Complementary Master in Nuclear Engineering

## GNUC2MC Programme

### Detailed programme by subject

#### CORE COURSES [51.0]

- 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...)

○ LBNE2000

Nuclear reactor theory (Centre d'étude nucléaire-Mol)

EN [q2] [ ] [6 Credits] 🌐

○ LBEN2001	Nuclear thermal-hydraulics (Centre d'étude nucléaire-Mol)		EN [q1] [] [5 Credits] 🌐
○ LBEN2002	Introduction to Nuclear Physics & Measurements (Centre d'étude nucléaire-Mol)		EN [q1] [] [3 Credits] 🌐
○ LBEN2003	Safety of Nuclear Powerplants (Centre d'étude nucléaire-Mol)		EN [q2] [] [5 Credits] 🌐
○ LBEN2006	Nuclear energy introduction (Centre d'étude nucléaire-Mol)		EN [q1] [] [3 Credits] 🌐
○ LBEN2008	Nuclear Materials (Centre d'étude nucléaire-Mol)		EN [q1] [] [3 Credits] 🌐
○ LBEN2010	Nuclear fuel cycle (Centre d'étude nucléaire-Mol)		EN [q1] [] [3 Credits] 🌐
○ LBEN2011	Radiation protection (Centre d'étude nucléaire-Mol)		EN [q1] [] [3 Credits] 🌐
○ LBEN2990	Graduation project/End of studies project		EN [] [] [20 Credits] 🌐 > French-friendly

## Cours au choix du master complémentaire en génie nucléaire [9.0]

### COURS AU CHOIX DU MASTER COMPLÉMENTAIRE EN GÉNIE NUCLÉAIRE [9.0]

- 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...)

#### o Content:

✘ LBNEN200	Advanced Nuclear Reactor Physics and Technology (Centre d'étude nucléaire-Mol)		EN [q2] [] [3 Credits] 🌐
✘ LBNEN201	Advanced Nuclear Materials (Centre d'étude nucléaire-Mol)		EN [q2] [] [3 Credits] 🌐
✘ LBNEN202	Advanced Radioprotection / Radioecology (Centre d'étude nucléaire-Mol)		EN [q1] [] [3 Credits] 🌐
✘ LBNEN203	Advanced Fuel Cycle/Dismantling/Radiochemistry/MOX/Th (Centre d'étude nucléaire-Mol)		EN [q2] [] [3 Credits] 🌐
✘ LBNEN204	Nuclear and Radiological Risk Governance (Centre d'étude nucléaire-Mol)		EN [q2] [] [3 Credits] 🌐
✘ LBNEN205	Advanced Course Elective Topic (Centre d'étude nucléaire-Mol)		EN [q2] [] [3 Credits] 🌐

## Supplementary classes

**To access this Master, students must have a good command of certain subjects. If this is not the case, students must take supplementary classes chosen by the faculty to satisfy course prerequisites.**

- 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 Supplementary classes

Maximum 60 credit(s)

## 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.

## GNUC2MC - Information

### Access Requirements

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

*Decree of 7 November 2013 defining the landscape of higher education and the academic organization of studies.*

*The admission requirements must be met prior to enrolment in the University.*

*Unless explicitly mentioned, the bachelor's, master's and licentiate degrees listed 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](#)

### General access requirements

Translated from [https://www.galilex.cfwb.be/fr/leg\\_res\\_01.php?ncda=39681&referant=l02](https://www.galilex.cfwb.be/fr/leg_res_01.php?ncda=39681&referant=l02)

Art. 112. of the "Décret définissant le paysage de l'enseignement supérieur et l'organisation académique des études" :

§ 1. In accordance with the general requirements established by the academic authorities, students who have:

1. a master's degree;
2. an academic degree similar to the one mentioned in the preceding paragraph awarded by a higher education institution in the Flemish Community or the German-speaking Community, or by the Royal Military Academy, by virtue of a decision of the academic authorities and in accordance with any additional requirements they may establish;
3. a foreign academic degree recognised as equivalent to those mentioned in paragraphs 1 and 2 pursuant to this decree, a European directive, an international convention or other legislation, in accordance with the same requirements.

The additional admission requirements referred to in paragraph 2 are intended to ensure that the student has acquired the knowledge and skills required for the studies in question. When the additional admission requirements consist of one or more additional course units, these may not represent more than 60 additional credits for the student, taking into account all the credits that he or she may otherwise use for admission. These course units are part of the student's study programme.

§ 2. In accordance with the general requirements established by the academic authorities, a student who holds a title, diploma, degree or certificate of higher education, in the French Community or outside it, which does not grant him or her eligibility for admission to a specialised master's course by virtue of the preceding paragraph, may nevertheless be admitted by the jury of the course in question, in accordance with the additional requirements that it establishes, if the totality of the higher education that he or she has completed or the expertise that he or she has acquired is valued by the jury to be at least 240 credits.

§ 3. By way of derogation from these general requirements, the academic authorities may also admit to a specialised master's course holders of a title, diploma, degree or certificate awarded outside the French Community which, in that system of origin, grants direct eligibility for postgraduate studies, even if the studies sanctioned by these credentials are not organised into distinct degree courses or within a time period of at least five years.

### Specific access requirements

**ATTENTION:** Register for this programme through the institution responsible for its administrative management, i.e. [ULB](#), not through the UCLouvain Enrolment Office.

This program is open to students :

1) On the basis of their degree : holders of the following degrees :

- "Ingénieur civil" of the French-speaking community
- "Burgerlijk ingenieur" of the Dutch-speaking community
- "Ingénieur civil polytechnique" of l'Ecole Royale Militaire, Brussels
- "Burgerlijk ingenieur polytechnicus" of the "Koninklijke Militaire School", Bruxelles

2) On the basis of a decision taken by the teaching committee (of this program) in function of an evaluation of the previous studies and experience of the candidates : candidates with another second cycle university degree or a degree from another institute of higher education of the French-speaking or Dutch-speaking communities (viz. Bio-ingénieur, Bio-ingenieur, Ingénieur civil architecte, Burgerlijk Ingenieur Architect, Licencié en Sciences, Licenciaat in Wetenschappen, Ingénieur Industriel, Industriël Ingenieur,...)

3) Candidates with a foreign higher education degree may be admitted within the limits stipulated in the Decrees (Decree of the French-speaking Community of 31 March 2004 on the definition of higher education and its integration in the European system of higher education and the refinancing of universities ; corresponding Decrees of the Dutch-speaking Community), following evaluation and approval by the Teaching Committee and respecting the regulations and procedures of the universities participating in the program.

4) Holders of the new degrees (Master ingénieur civil and Master in ingenieurswetenschappen) awarded according to the above-mentioned decrees will have the same rights as soon as these degrees have been awarded by Belgian universities.

Students may enrol in the participating university of their choice. Students' candidacies will first be submitted to the Teaching Committee of the BNEN which will then make a recommendation in function of the criteria set out above.

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Accessible to adults

A significant number of the students (about half) are young engineers professionally involved in the Belgian nuclear sector. The complementary degree will give them access to positions of responsibility.

The advanced electives are in part intended as continuing training and are open to foreign participants.

To make it easier for adults to take these courses, they are given as modules. Each course runs from several days to two or three weeks according to its size (number of credits). The timetable is meticulously arranged in advance to enable students engaged in professional life to manage their time between courses and work in consultation with their employer. In addition, these students may spread their program over two years.



## Teaching method

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Access to the resources (researchers and laboratories with their major infrastructure) of the Centre d'Études Nucléaires (SCK•CEN) is indispensable to ensure the pedagogical quality of this program. The interuniversity partnership guarantees the availability of the diversity of expertises necessary, as well as the quality of the teaching staff.

The modular system of each course concentrated over a limited period from several days to three weeks facilitates the participation of students engaged in professional life as well as foreign students.

## Evaluation

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**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 learning activities are evaluated according to the rules in force at the University (see examination regulations), viz. written and oral examinations, laboratory examinations, individual and group work, public presentations of projects, and thesis defence.

## Mobility and/or Internationalisation outlook

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The courses and practical work are given in English.

Since the foundation of the BNEN consortium (Belgian Nuclear higher Education Network), which has been in charge of the organisation of this program, the international dimension has been provided by student exchanges, as well as by the offer of three courses especially adapted to exchanges within the European Interuniversity Association ENEN (European Nuclear Education Network - <http://www.enen-assoc.org/>). Students have the possibility of following part of their course in another university of this association. If they have acquired 20 credits in this context, the ENEN association will award the certificate "European Master of Science in Nuclear Engineering". Some of these mobility exchanges can be financed within the Erasmus program.

## Possible trainings at the end of the programme

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The program is organised conjointly by six universities: UCL, ULg, ULB, KULeuven, UGent, VUB. The courses are given in rooms made available to the universities by the Study Centre for Nuclear Energy at Mol (SCK.CEN). The practical work relies on the substantial infrastructure and laboratories of the Centre. The researchers of the Centre also assist with the practical work.

## Contacts

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### Curriculum Management

Entity

Structure entity

Denomination

Sector

Acronym

Postal address

SST/IMMC

(IMMC)

Sciences and Technology (SST)

IMMC

Place du Levant 2 - bte L5.04.01

1348 Louvain-la-Neuve

Tel: +32 (0) 10 47 22 00

<https://uclouvain.be/en/research-institutes/immc>

Website

Mandate(s)

- Président : Hervé Jeanmart

Commission(s) of programme

- Civil and environmental engineering (GCE)
- Materials and process engineering (IMAP)
- Mechatronic, Electrical Energy, and Dynamic Systems (MEED)
- Applied mechanics and mathematics (MEMA)

- Thermodynamics and fluid mechanics (TFL)
- Laboratoire d'Analyse, Caractérisation et Mise en oeuvre (ACAM)
- Conception, Réalisation et Essais de Dispositifs ElectroMécaniques (CRDM)
- Laboratoire Essais mécaniques, Structures et génie civil (EMSC)

Academic supervisor: [Yann Bartosiewicz](#)

Jury

- Président du Jury: [Jean-Didier Legat](#)
- Secrétaire du Jury: [Yann Bartosiewicz](#)

Useful Contact(s)

- Secrétariat: [Isabelle Hennau](#)

