



La version que vous consultez n'est pas définitive. Ce programme peut encore faire l'objet de modifications. La version finale sera disponible le 1er juin.

A Bruxelles Woluwe - 60 crédits - 1 année - Horaire de jour - En anglais

Mémoire/Travail de fin d'études : **OUI** - Stage : **NON**

Activités en anglais: **OUI** - Activités en d'autres langues : **NON**

Activités sur d'autres sites : **OUI**

Domaine d'études principal : **Sciences biomédicales et pharmaceutiques**

Organisé par: **Faculté de pharmacie et des sciences biomédicales (FASB)**

Sigle du programme: **PMTX2MC** - Cadre francophone de certification (CFC): 7

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PMTX2MC - Introduction

INTRODUCTION

Introduction

This program, the Master of Pharmacometrics, is a joint effort by KULeuven and UCLouvain, aiming to attract candidates from diverse academic backgrounds such as pharmaceutical sciences, biomedical sciences, medicine, statistics, and more. It offers the opportunity to specialize in the fast-growing field of pharmacometrics and prepares graduates for roles in the pharmaceutical industry, hospitals, the public sector, or scientific research. Both institutions have heavily invested in building solid research foundations in pharmacometrics. They aim to leverage this expertise to train candidates in collaboration with experts from industry, hospitals, and the public sector. By choosing a joint program, the teams from both universities complement and strengthen each other, ensuring high-level training.

Pharmacometrics is the science of developing and applying statistical models to predict the behavior of drugs in the human body. These models can determine the potential effects and side effects of drugs, including in specific patient groups such as those who are obese or have liver or kidney failure. By mathematically modeling these effects, predictions can be made about drugs still in development, guiding the development process. Pharmacometric models help ensure targeted drug development, reducing the need for studies on laboratory animals or large groups of patients. In clinical practice, these models are crucial for making informed decisions about drug choice and dosage tailored to individual patient characteristics. Information from pharmacometric models is essential for making sound decisions regarding drug approval and reimbursement.

Votre profil

The Advanced Master of Pharmacometrics program at KULeuven and UCLouvain is designed for individuals with diverse academic backgrounds, including pharmaceutical sciences, biomedical sciences, medicine, and statistics. The program is also open to holders of a Master's degree in (bio-)engineering, biology, chemistry, statistics, epidemiology, mathematics, physics, or any other related discipline (see access criteria).

Ideal candidates are eager to specialize in the fast-growing field of pharmacometrics, aiming to make significant contributions to the pharmaceutical industry, hospitals, public sector, or scientific research. Candidates should have a particular interest in pharmacology, pharmacotherapy, as well as mathematics, biostatistics, and modeling approaches. You will benefit from the robust research and mentorship provided by both institutions, learning from leading experts and collaborating with professionals from various sectors. This program promotes student autonomy, encouraging you to take initiative and develop independent research skills.

Motivated by the potential to impact drug development and clinical practice, ensuring safer and more effective treatments tailored to individual patient needs, this program is for those looking to advance their careers and make a difference in the world of healthcare.

Votre futur job

As a pharmacometrician, you will apply quantitative methods to study the behavior and effects of drugs in humans (and, possibly, animals). You will work in various settings, including pharmaceutical companies, academic institutions, contract research organizations, and regulatory agencies. Your main responsibilities will include developing and validating pharmacokinetic and pharmacodynamic models, which describe how drugs are absorbed, distributed, metabolized, and eliminated in the body, as well as how they interact with biological targets to produce responses.

Additionally, you will perform population pharmacokinetic (popPK) and pharmacokinetic/pharmacodynamic analyses to account for variability in drug exposure and response among different individuals or groups. You will design, conduct, and interpret simulations and scenarios based on these models to optimize drug development strategies, trial designs, dosing regimens, and extrapolations across populations or indications.

Finally, you will communicate your findings to internal and external stakeholders, including project teams, management, clinicians, and regulators, ensuring that your insights contribute to the advancement of safe and effective drug therapies.

Votre programme

The program of 60 ECTS is structured around 4 blocks that follow the logical workflow of constructing a pharmacometric model and is taught in English. Each block will conclude with an integrative group project. Each block consists of 15 ECTS. An overview of the full program with a detailed list of the different courses in each block is given in the [dedicated section](#). To develop the program, we focused on the two figures below that show the process of Pharmacometrics and all the aspects that need to be included in the program (Figures 1 and 2).

PMTX2MC - Profil enseignement

COMPÉTENCES ET ACQUIS AU TERME DE LA FORMATION

Au terme de ce programme, le diplômé est capable de :

- 1 Has in-depth knowledge and understanding of the concepts of pharmacokinetics and pharmacodynamics, and the interrelationships with human biology, disease mechanisms and pharmacology.
- 2 Has knowledge and understanding of the statistics and mathematics underlying the pharmacometric modelling of complex data to answer pharmacological questions.
- 3 Has knowledge and understanding of the methods and software tools used in the field of pharmacometrics.
- 4 Applies statistical/mathematical language, pharmacometric tools and methods to specific problems.
- 5 Translates results of pharmacometrics modelling and simulations correctly into actionable insights, recommendations and decisions that can be used in drug discovery, development, regulatory and clinical care.
- 6 Is able to independently scope a pharmacological project, (re-)formulate the critical pharmacometric questions, define the workflow and perform the project on the basis of the knowledge and skills acquired.
- 7 Communicates audience-tailored, orally and in writing, in an appropriate and effective manner to diverse stakeholders.

STRUCTURE DU PROGRAMME

The programme (60 credits - 57 compulsory course credits - including the Master's dissertation and 3 elective course credits) consists of 4 blocks of 15 credits, including 3 more theoretical blocks, and a Master's dissertation block. Each theoretical block also includes an integrative work, during which students work in groups on a specific pharmacological problem. The Master's dissertation consists of a specific research project in a research environment (industry, university research group, hospital, etc.) where students explore their subject individually. All the topics for the Master's thesis are already presented in the first teaching unit, which allows students to make an early choice and to follow the theoretical learning with the subject of their Master's thesis in mind.

PMTX2MC Programme










PROGRAMME DÉTAILLÉ PAR MATIÈRE

Tronc Commun

- Obligatoire
- ✂ Au choix
- △ Exceptionnellement, non organisé cette année académique 2025-2026
- Non organisé cette année académique 2025-2026 mais organisé l'année suivante
- ⊕ Organisé cette année académique 2025-2026 mais non organisé l'année suivante
- △ ⊕ Exceptionnellement, non organisé cette année académique 2025-2026 et l'année suivante
- Activité avec prérequis
- 🌐 Cours accessibles aux étudiants d'échange
- 🌐 Cours NON accessibles aux étudiants d'échange
- [FR] Langue d'enseignement (FR, EN, ES, NL, DE, ...)



Cliquez sur l'intitulé du cours pour consulter le cahier des charges détaillé (objectifs, méthodes, évaluation, etc.)

o Mandatory courses

○ WPMTX2001	Drug life cycle [C]		EN [q1] [22.5h] [3 Crédits] 
○ WPMTX2004	Data management [C]		EN [q1] [22.5h+15h] [4 Crédits] 
○ WPMTX2005	Integrative work 1 [C]		EN [q1] [0h+15h] [3 Crédits] 
○ WPMTX2006	Modeling [C] <i>This course is taught on the Gasthuisberg Campus in Leuven.</i>		EN [q1] [38h+19h] [8 Crédits] 
○ WPMTX2007	Simulation [C] <i>This course is taught on the Gasthuisberg Campus in Leuven.</i>		EN [q1] [19h+10h] [4 Crédits] 
○ WPMTX2008	Integrative work 2 [C]		EN [q1] [0h+22.5h] [3 Crédits] 
○ WPMTX2009	Physiologically-based pharmacokinetics modeling and simulation [C] <i>This course is taught on the Gasthuisberg Campus in Leuven.</i>		EN [q2] [33h+33h] [7 Crédits] 
○ WPMTX2010	Integrative work 3 [C]		EN [q2] [0h+22.5h] [5 Crédits] 
○ WPMTX2011	Master thesis [C]		EN [q2] [] [15 Crédits] 

o Compulsory elective courses

The student chooses one of the following two courses based on their previous experience and their project.

⊗ WPMTX2002	Concepts of multilevel, longitudinal, and mixed models [C] <i>This course is taught on the Gasthuisberg Campus in Leuven.</i>		EN [q1] [35h] [5 Crédits] 
⊗ WPMTX2003	Basic concepts of pharmacokinetics and pharmacodynamics [C]		EN [q1] [30h] [5 Crédits] 

o Elective courses

The student chooses 3 credits from the UCLouvain or KULeuven program.

COURS ET ACQUIS D'APPRENTISSAGE DU PROGRAMME

Pour chaque programme de formation de l'UCLouvain, [un référentiel d'acquis d'apprentissage](#) précise les compétences attendues de tout-e diplômé-e au terme du programme. Les fiches descriptives des unités d'enseignement du programme précisent les acquis d'apprentissage visés par l'unité d'enseignement ainsi que sa contribution au référentiel d'acquis d'apprentissage du programme.

PMTX2MC - Informations diverses

CONDITIONS D'ACCÈS

Décret du 7 novembre 2013 définissant le paysage de l'enseignement supérieur et l'organisation académique des études.

Les conditions d'admission doivent être remplies au moment même de l'inscription à l'université.

Sauf mention explicite, les bacheliers, masters et licences repris dans cette page sont à entendre comme étant ceux délivrés par un établissement de la Communauté française, flamande ou germanophone ou par l'Ecole royale militaire.

SOMMAIRE

- [Conditions d'accès générales](#)
- [Conditions d'accès spécifiques](#)

Conditions d'accès générales

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

§ 1er. Aux conditions générales fixées par les autorités académiques, ont accès aux études de master de spécialisation les étudiants qui sont porteurs :

1° d'un grade académique de master ;

2° d'un grade académique similaire à celui mentionné au littera précédent délivré par un établissement d'enseignement supérieur en Communauté flamande, en Communauté germanophone ou par l'Ecole royale militaire, en vertu d'une décision des autorités académiques et aux éventuelles conditions complémentaires qu'elles fixent ;

3° d'un grade académique étranger reconnu équivalent à celui mentionné au littera 1° en application du présent décret, d'une directive européenne, d'une convention internationale ou d'une autre législation, aux mêmes conditions.

Les conditions complémentaires d'accès visées au littera 2° sont destinées à s'assurer que l'étudiant a acquis les matières et compétences requises pour les études visées. Lorsque ces conditions complémentaires d'accès consistent en un ou plusieurs enseignements supplémentaires, ceux-ci ne peuvent représenter pour l'étudiant plus de 60 crédits supplémentaires, compte tenu de l'ensemble des crédits qu'il peut par ailleurs valoriser lors de son admission. Ces enseignements font partie de son programme d'études.

§ 2. Aux conditions générales fixées par les autorités académiques, l'étudiant porteur d'un titre, diplôme, grade ou certificat de deuxième cycle, en Communauté française ou extérieur à celle-ci, qui ne lui donne pas accès aux études de master de spécialisation en vertu du paragraphe précédent peut toutefois y être admis par le jury des études visées, aux conditions complémentaires qu'il fixe, si l'ensemble des études supérieures qu'il a suivies ou les compétences qu'il a acquises sont valorisées par le jury pour au moins 240 crédits.

§ 3. Par dérogation à ces conditions générales, aux conditions complémentaires qu'elles fixent, les autorités académiques peuvent également admettre aux études de master de spécialisation les porteurs d'un titre, diplôme, grade ou certificat délivré hors Communauté française qui, dans ce système d'origine, donne directement accès aux études de troisième cycle, même si les études sanctionnées par ces grades n'y sont pas organisées en cycles distincts ou en cinq années au moins.

Conditions d'accès spécifiques

The admission to the program is organized as follows:

Direct admission:

To be directly admitted to the Advanced Master's program in pharmacometrics, candidates must hold a Belgian or European master's degree in Pharmacy, Biomedical Sciences, Medicine or Veterinary Medicine.

Admission through evaluation by an admissions committee:

Subject to the evaluation of dossiers by the admissions committee, this Advanced Master's program will also be open

- to candidates with a master's degree in Pharmacy, Biomedical Sciences, Medicine or Veterinary Medicine obtained at a non-European institution
- to (international) holders of a master's degree in (bio-)Engineering, Biology, Chemistry, Statistics, Epidemiology, Mathematics, Physics or any other related discipline.

Admission based on dossier means that based on the submitted dossier and the content of the candidate's prior education, admission may be direct, or after a preparatory program for up to 60 credits (ECTS), or may be refused.

The submission of the explanatory dossier must be introduced to UCLouvain. This dossier must include a detailed academic curriculum (previous degrees, grade list, ranking, etc.) as well as a motivation letter. If necessary, the admissions committee may request to hear candidates' motivations.

Recognition of qualifications and of periods of studies will be applied in line with the Lisbon Recognition Convention. Students can apply for an exemption from a course, given previous studies, and/or work experience. If applications are consented by the Steering

Committee, consideration of previous studies or work experience shall take place in accordance with the procedures established at the coordinating university.

As for applicants from outside Belgium, comparability of the diploma is not always easily established, applicants will be asked to upload the following documents with their application:

Scans of transcripts and diplomas are required for all applicants. These documents are sufficient for all applicants from universities that have an exchange agreement with the KULeuven or UCLouvain for the relevant discipline (i.e. pharmacy, medicine, biomedical sciences), or universities that are in the global top 200 in the most recent Times Higher Education or QS rankings.

Additional documentation is required for applicants from other universities as it is impossible to reliably assess the comparability. In those cases, the admission board will take a positive decision only if supporting information is provided:

- A complete list of course titles for which credits have been obtained should be part of this. The course size (in ECTS-credits) and the result obtained should be indicated, preferably according to the ECTS-scale; if a different scale is used, a summary explanation on the meaning of the scores should be provided.
- For the courses that are deemed by the applicant most relevant as a preparation for the master of Pharmacometrics, a short (about one half to one page) description according to the standard guidelines for an ECTS-study guide should be provided as well.

The Admissions Committee will evaluate all applications and has the final say in the

admissibility of the student, taking into account the relevant information provided and the above-mentioned regulations.

PÉDAGOGIE

The Advanced Master of Pharmacometrics program emphasizes a pedagogy that promotes autonomy and self-empowerment, fostering the transversal transfer of competencies among students. This is achieved through problem-based learning situations and integrative group work, where students from diverse backgrounds collaborate to solve complex problems. This collaborative approach ensures that students learn from each other's unique perspectives and expertise. Additionally, the master thesis serves as a capstone project, ensuring that all competencies and outcomes are individually acquired and applicable to real-life problems, preparing graduates for practical challenges in their future careers.

EVALUATION AU COURS DE LA FORMATION

Les méthodes d'évaluation sont conformes au [règlement des études et des examens](#). Plus de précisions sur les modalités propres à chaque unité d'apprentissage sont disponibles dans leur fiche descriptive, à la rubrique « Mode d'évaluation des acquis des étudiants ».

Throughout the course, a variety of assessment formats are introduced, ranging from traditional written and oral exams, open and closed book, assignments, presentations, tasks, but also online exams (e.g. XToledo or Ans). On the one hand, this enables a wide range of learning outcomes to be assessed, both in terms of knowledge and understanding, but also communication skills and research skills. On the other hand, it allows all students to experience a range of assessment formats, without favouring any particular assessment format that might be better or less well suited to the personality of individual students.