

At Louvain-la-Neuve - 120 credits - 2 years - Day schedule - In French

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

Activities in English: **YES** - Activities in other languages : **NO** **2023-2024**

BSTA2M - Introduction

Introduction

Introduction

Organized by Louvain School of Statistics, Biostatistics and Actuarial Sciences (LSBA), this Master's program offers you

- A training in the fundamental concepts of statistics, using the main technical tools and software for the analysis of statistical data and the specific statistical methods required in the field of statistics in health sciences.
- A training in applied statistics to the medical field, in clinical and pre-clinical research, pharmaceutical research, epidemiology and other life sciences oriented fields.
- Several opportunities to put in practice statistical techniques based on exercises, individual projects, analyses of real data using statistical software and the preparation of a Master's thesis, possibly in collaboration with an external industry.

BSTA2M - Teaching profile

Learning outcomes

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

1. Maîtriser un socle fondamental de la probabilité et de la statistique.

1.1

Maîtriser les calculs mathématiques fondamentaux.

1.2

Résumer un texte de méthodologie statistique et situer les limites de ses connaissances face à un problème donné.

1.3

Utiliser les outils fondamentaux de calcul et de programmation dans des problèmes de probabilité et statistique.

1.4

Reconnaître les concepts fondamentaux et transversaux d'importantes théories de probabilité et statistique actuelles et établir les liens principaux entre ces théories.

1.5

Expliquer des théories de probabilité et statistique en motivant les énoncés et les définitions par des exemples et des contre-exemples et en mettant en évidence les idées principales.

1.6

Relier des concepts de probabilité et de statistique et des problématiques associées à leur contexte historique en ayant compris le rôle de ces outils en science.

2.

S'exprimer de façon claire, précise et rigoureuse dans les activités de communication tant en français que en anglais (niveau B1 [CECRL](#)).

2.1

Saisir, résumer et interpréter l'essentiel de communications scientifiques orales en statistique et probabilité.

2.2

Résumer, par des tables et graphiques informatifs et pertinents, l'information disponible dans un ensemble de données.

2.3

Rédiger des textes statistiques selon les conventions de la discipline.

2.4

Structurer un exposé oral, mettre en évidence les éléments clés, distinguer techniques et concepts et adapter l'exposé au niveau d'expertise des auditeurs.

2.5

Utiliser des outils médiatiques et informatiques variés pour communiquer (expliquer, rédiger, publier) des résultats d'analyses statistiques et leur interprétation dans le contexte de l'étude.

2.6

Dialoguer avec des collègues d'autres disciplines.

3.

Analyser rigoureusement et dans différents contextes disciplinaires, un problème ou un système complexe pour en extraire les points essentiels et les mettre en relation avec les outils théoriques les mieux adaptés.

3.1

Utiliser des solides connaissances de la méthodologie statistique dans des contextes multidisciplinaires liés aux sciences du vivant (médecine, biologie, etc).

3.2

Analyser un problème statistique et proposer une méthode (en validant les hypothèses sous-jacentes) et des outils adéquats pour l'étudier et le résoudre de façon approfondie et originale.

3.3

Utiliser plusieurs outils informatiques d'aide à la résolution de problèmes statistiques, tout en connaissant les limitations de ces outils.

3.4

Développer une analyse rigoureuse et originale pour comprendre et résoudre des problèmes spécifiques dans tous les domaines d'application de la biostatistique qu'il rencontrera dans sa profession, en respectant les contraintes imposées par le contexte.

3.5

of 5 credits. These extra-curricular courses must be relevant, of a sufficient level and adapted to the profile of the program and of the student.

The student prepares his program in consultation with a study advisor, then submits it to the jury for approval.

For a typical program, this master will count, regardless of the options and / or elective courses selected, a minimum of 120 credits spread over two annual blocks corresponding to a minimum of 60 credits each.

BSTA2M Programme

Detailed programme by subject

CORE COURSES

- Mandatory
- ⊗ Optional
- △ Not offered in 2023-2024
- ⊖ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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

PROFESSIONAL FOCUS [30.0]

La finalité spécialisée comprend le mémoire, l'UE de base en statistique du biostatisticien et une UE en statistique appliquée.

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Year

1 2

o Content:

o Cours obligatoires de la finalité

○ LSTAT2828	memory in biostatistics		(FR) [q1 or q2] [] [20 Credits] 🌐		x
○ LSTAT2330	Statistics in clinical trials.	Catherine Legrand Annie Robert	(FR) [q2] [22.5h+7.5h] [5 Credits] 🌐	x	

OPTIONS

The student completes his program by choosing teaching units in the options and respecting the instructions of each option.

If the student chooses 15 or more credits in an option (including compulsory courses), this option will appear on the appendix of his diploma.

- > [Biostatistique clinique et épidémiologie](#) [en-prog-2023-bsta2m-bbsta220o]
 > [Biométrie, technométrie et bioinformatique](#) [en-prog-2023-bsta2m-lbsta210o]

BIostatistique Clinique et Épidémiologie

- Mandatory
- ⊗ Optional
- △ Not offered in 2023-2024
- ⊙ Not offered in 2023-2024 but offered the following year
- ⊕ Offered in 2023-2024 but not the following year
- △ ⊕ Not offered in 2023-2024 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...)

The student will validate this option if he/she obtains between 15 and 30 credits among the following courses.

Year

1 2

o Content:

o Choisir au moins un cours parmi

⊗ WFSP2218	Longitudinal analysis: linear, logistic and Poisson regression	Annie Robert	FR [q1] [20h+20h] [4 Credits] 🌐	X	X
⊗ WFSP2228	Systematic literature review, realist evaluation and meta-analysis	Annie Robert (coord.) Kiswendsida Clovis Sawadogo	FR [q2] [20h+10h] [3 Credits] 🌐	X	X

⊗ Cours au choix

⊗ WESP2234	Clinical decision making	Andrea Penalzoza-Baeza Annie Robert (coord.) Kiswendsida Clovis Sawadogo	FR [q1] [30h] [3 Credits] 🌐	X	X
⊗ WFSP2201	Advanced methods in public health : seminar	Niko Speybroeck	EN [q2] [15h] [3 Credits] △ 🌐	X	X
⊗ WFSP2202	Health survey methods	Stefaan Demarest Lydia Gisle Vincent Lorant (coord.)	EN [q1] [20h] [5 Credits] 🌐	X	X
⊗ WFARM2196	Rational therapeutic choices (Introduction to evidence-based medicine and pharmacoconomy)	Noémie Defourmy (compensates) Séverine Henrard Nathalie Dujardin Anne Spinewine (coord.)	FR [q1] [30h+10h] [4 Credits] 🌐	X	X
⊗ WFARM2513	Pharmacocinétique approfondie	Laure Elens	FR [q2] [22.5h] [3 Credits] 🌐 > English-friendly	X	X

BIOMÉTRIE, TECHNOMÉTRIE ET BIOINFORMATIQUE

- Mandatory
 - ✘ Optional
 - △ Not offered in 2023-2024
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 - ⊕ Offered in 2023-2024 but not the following year
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 - Activity with requisites
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-

Year

1	2
x	x

WSBIM2243

Digital processing of medical images

Benoît Macq

[q2] [30h+15h] [4 Credits]

⌘ WMD1102	Physique expérimentale et introduction mathématique aux sciences expérimentales (1e partie)	Fabio Maltoni Geoffroy Piroux	PK [q1] [60h+21h] [8 Credits] 🌐
⌘ WMDS1113	Epidémiologie, santé publique et soins de santé	Benoît Boland Séverine Henrard Jean Macq (coord.) Andrea Penaloza-Baeza	PK [q2] [30h+20h] [4 Credits] 🌐

⌘ Cours de probabilités et statistique

⌘ LBIR1212	Probabilities and statistics (I)	
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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:

- require the student to combine registration in two separate CUs which it considers necessary from a pedagogical point of view.
- transform a prerequisite into a corequisite if the student is in the final year of a degree course.

For more information, please consult the [Academic Regulations and Procedures](https://uclouvain.be/fr/decouvrir/rgee.html) (<https://uclouvain.be/fr/decouvrir/rgee.html>).

Prerequisites list

LSTAT2930 "[Stage ou travail d'application en biostatistique](#)" has prerequisite(s) LSTAT2020 ET LSTAT2110 ET LSTAT2120


- LSTAT2020 - [Statistical softwares and basic statistical programming](#)
- LSTAT2110 - [Data Analysis](#)
- LSTAT2120 - [Linear models](#)

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.

BSTA2M -

Tous les autres bacheliers	if the student did not succeed Minor in Statistics, Actuarial Sciences and Data Sciences and LFSAB1221 Supplementary classes: - LBIO1110 , LBIO1111 or LIEPR1004A - and/or LSTAT2011 , LSTAT2012 , LSTAT2013	Access based on application authorisation from the faculty/ school.
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Tous les autres licenciés	<p>LBIO1110, LBIO1111 or LIEPR1004A is supplementary classes for students who have not taken an equivalent course.</p> <p>LSTAT2011, LSTAT2012, LSTAT2013 are supplementary classes for students who have not taken an equivalent course.</p>	Access based on application	Subject to the acceptance of the jury, a student may be exempted from a maximum of 60 activity credits and possibly complete the master's degree in Biostatistics in a single year.
Masters			
Masters belges de la communauté française: Bioingénieur Ingénieur civil (sauf ingénieur civil architecte) Sciences mathématiques Ingénieur de gestion Sciences informatiques Sciences physiques Science des données	<p>LBIO1110, LBIO1111 or LIEPR1004A is supplementary classes for students who have not taken an equivalent course.</p>	Direct access	Subject to the acceptance of the jury, a student may be exempted from a maximum of 60 activity credits and possibly complete the master's degree in Biostatistics in a single year.
Sciences biologiques Sciences biomédicales	<p>LSTAT2011, LSTAT2012, LSTAT2013 are supplementary classes for students who have not taken an equivalent course.</p>	Access based on application	
Tous les autres masters	<p>LBIO1110, LBIO1111 ou LIEPR1004A is supplementary classes for students who have not taken an equivalent course.</p> <p>LSTAT2011, LSTAT2012, LSTAT2013 are supplementary classes for students who have not taken an equivalent course.</p>	Access based on application	Subject to the acceptance of the jury, a student may be exempted from a maximum of 60 activity credits and possibly complete the master's degree in Biostatistics in a single year.

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.

Foreign students who have succeeded an university education (minimum 3 years) with strong quantitative connotation and who have obtained at least 70% (or 14/20) of average for all successful university years in their home university, without fail in mathematics/statistics/probability, have the possibility to apply for admission to the master's program in statistics, biostatistics orientation (120 ECTS).

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

The student contacts the LSBA secretariat if a faculty authorization has been requested by the registration service. The student then establishes his program with the study consultant of the purpose concerned (<https://uclouvain.be/fr/facultes/sc/infos-lsba.html>).

