UCLouvain

BSTA2M

2020 - 2021

Master [120] in Statistic: Biostatistics

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**
Activities on other sites : **YES**
Main study domain : **Sciences**
Organized by: **Faculty of Science (SC)**
Programme acronym: **BSTA2M** - Francophone Certification Framework: 7

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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 partner.

Your profile

You

- Hold an undergraduate diploma and you wish to become a specialist in data analysis methods or to develop new innovative tools in this field;
- Hold an undergraduate diploma or Master's degree from a University or a University college and statistics is an additional competence to your actual training;
- Are looking for a training in statistics applied to the medical fields, and in particular to clinical and pre-clinical research, pharmaceutical research, epidemiology, public health or in another field of life sciences.

Your programme

The program of Master's degree in Statistics with the Biostatistics orientation is composed of a core study program of 62 to 74 credits of courses (UE), a possible internship or applied project of 10 credits and 30 credits (including the Master's thesis) of professional focus (*finalité spécialisée*). You will complete your programs with courses from the two options of the programs as well as by other appropriate courses from other programs (upon acceptance by the jury).

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

Retracer l'évolution historique des concepts de probabilité et de statistique et des problématiques associées, en ayant compris le rôle de probabilité et statistique dans divers pans de l'ensemble des connaissances et de la culture.

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 clef, 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

Gérer de grandes bases de données.

4.

Maîtriser les méthodes de base en probabilité et statistique et utiliser les outils spécifiques de la bio-statistique.

4.1

Développer de façon autonome son intuition statistique en anticipant les résultats attendus et en vérifiant la cohérence avec des résultats déjà existants.

4.2

Analyser un problème de recherche et proposer des outils adéquats pour l'étudier de façon approfondie et originale.

4.3

Etudier les propriétés de méthodes statistiques à l'aide de simulation.

4.4

Collaborer à la rédaction d'une communication scientifique pour une publication avec comité de revue.

4.5

Adapter des méthodes statistiques à des problématiques des sciences du vivant.

5.

Participer à la mise en Œuvre d'un projet de recherche avec un collaborateur issu d'une discipline des sciences du vivant.

5.1

Communiquer avec un collaborateur d'une des disciplines des sciences du vivant (médecin, pharmacien, ingénieur agronome, etc.), lui apporter un regard proactif et objectif par rapport à son problème, faire preuve de curiosité et de connaissances minimales pour sa discipline.

5.2

Cerner et reformuler les questions du collaborateur et y apporter des réponses adéquates, originales, documentées.

5.3

Planifier l'étude à mettre en oeuvre (par exemple, un essai clinique) pour apporter des réponses aux questions du collaborateur, identifier le plan d'expérience optimal.

5.4

Anticiper les différentes difficultés dans le déroulement d'une étude et proposer une solution appropriée.

5.5

Conseiller le collaborateur sur les aspects statistiques lors du déroulement de l'étude.

5.6

Ecrire un rapport clair, succinct et rigoureux présentant les résultats d'une analyse statistique appropriées des données.

5.7

Expliquer les résultats des analyses statistiques aux collaborateurs non-statisticiens.

6.

Etre autonome dans ses apprentissages et faire preuve d'esprit critique.

6.1

Rechercher dans la littérature statistique des sources et évaluer leur pertinence.

6.2

Lire et comprendre un texte statistique avancé et le situer correctement par rapport aux connaissances acquises.

6.3

Modéliser et résoudre un problème donné et être capable de s'initier à un nouveau champ de connaissances.

6.4

Juger de façon autonome de la pertinence d'une démarche statistique et de l'intérêt d'une théorie statistique.

Programme structure

The program consists of

- a common core of 62 to 74 credits
- a focus of 30 credits including a thesis of 25 credits
- teaching units to choose from the options of the programme "Clinical Biostatistics/Epidemiology" and "Biometrics, Technometrics and Bioinformatics" from which he must choose at least one.

The student may request to include in his programme other teaching units relevant to the Master's degree up to a maximum of 15 credits. These courses will be submitted to the jury for approval. Among these 15 credits, a language course may appear for a maximum of 5 credits. This course must be relevant, of a sufficient level and adapted to the profile of the program and the student.

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

The student's 120-credit core program will include a maximum of 59 credits also appearing in the Master's program in Statistics, General Orientation.

For a programme-type, and regardless of the focus, options/or elective courses selected, this master will carry a minimum of 120 credits divided over two annual units, corresponding to 60 credits each.

> Tronc commun *[en-prog-2020-bsta2m-tronc_commun]*

Liste au choix de finalités BSTA2M

> Professional Focus *[en-prog-2020-bsta2m-lbsta200s]*

> List of electives *[en-prog-2020-bsta2m-options]*

> Biostatistique clinique/épidémiologie *[en-prog-2020-bsta2m-bbsta220o]*
> Biométrie, technométrie et bioinformatique *[en-prog-2020-bsta2m-lbsta210o]*

Preparatory Module *(only for students who qualify for the course via complementary coursework)*

> Master [120] in Statistic: Biostatistics *[en-prog-2020-bsta2m-module_complementaire]*

BSTA2M Detailled programme

Programme by subject

CORE COURSES

O Mandatory	⊠ Optional
△ Courses not taught during 2020-2021	⊘ Periodic courses not taught during 2020-2021
⊕ Periodic courses taught during 2020-2021	Activity with requisites

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

O Cours obligatoires de statistique générale (35 credits)

						Year 1	Year 2
O LSTAT2020	Statistical softwares and basic statistical programming	Céline Bugli	15h+15h	4 Credits	q1	x	
O LSTAT2030	Statistique et data sciences avec R: Programmation avancée	Anouar El Ghouch	15h+15h	4 Credits	q2	x	
O LSTAT2040	Statistical analysis	Benjamin Colling (compensates Anouar El Ghouch)	30h+15h	5 Credits	q2	x	
O LSTAT2100	Discrete data analysis.	Anouar El Ghouch	30h+7.5h	5 Credits	q2	x	
O LSTAT2110	Data Analysis	Johan Segers	30h+7.5h	5 Credits	q1	x	
O LSTAT2120	Linear models	Christian Hafner	30h+7.5h	5 Credits	q1	x	
O LSTAT2130	Introduction to Bayesian statistics	Philippe Lambert	15h+5h	4 Credits	q2	x	
O LSTAT2390	Applied statistics workshops	Catherine Legrand Christian Ritter	15h	3 Credits	q1+q2		x

O Cours de statistique et biostatistique spécifiques à l'orientation biostatistique

Minimum 21 credits

						Year 1	2
LSTAT2210	Advenced linear models	Lieven Desmet (compensates Catherine Legrand)	15h+5h	4 Credits	q1		x
LSTAT2220	Analysis of survival and duration data	Ingrid Van Keilegom	15h+5h	4 Credits	q1	x	x
LSTAT2320	Design of experiment.	Patrick Bogaert Bernadette Govaerts	22.5h +7.5h	5 Credits	q2	x	x

Cours au choix
Choisir au moins deux cours parmi:

LSTAT2230	Advanced survival models	Catherine Legrand	15h	3 Credits	q2		x
LSTAT2340	Statistical Analyses of ¿omics Data	Céline Bugli Bernadette Govaerts	15h	4 Credits	q2	x	x
WFSP2238	Advanced epidemiology	Niko Speybroeck	20h+20h	5 Credits	q2	x	x

Cours au choix de statistique

L'étudiant choisira au minimum 6 crédits dans les cours proposés dans le programme du master en statistiques, orientation générale. En particulier, les cours suivants sont recommandés:

LSTAT2140	Non parametric statistics	Eugen Pircalabelu	15h+5h	4 Credits	q1	x	x
LSTAT2150	Nonparametric statistics: smoothings methods	Rainer von Sachs	15h+5h	4 Credits	q1	x	x
LSTAT2170	Times series	Rainer von Sachs	22.5h +7.5h	5 Credits	q2	x	x
LSTAT2180	Resampling methods with applications	Eugen Pircalabelu	15h+5h	4 Credits	q1	x	x
LDATS2360	Seminar in data management: basic	Céline Bugli	15h+10h	5 Credits	q1	x	x
LDATS2370	Data Management II : SAS ADVANCED PROGRAMMING	Christophe Kabacinski	15h+10h	5 Credits	q2	x	x
LSTAT2380	Statistical consulting	Christian Ritter	30h	5 Credits	q1+q2	x	x
LSTAT2410	Copulas: models and inference	Johan Segers	15h	3 Credits	q1 ⊘	x	x

Stage optionnel (10 credits)

LSTAT2930	Training course or work of application in biostatistics			10 Credits	q1 or q2	x	x

Philosophie

Choisir maximum un cours parmi:

LFILO2003E	Ethics in the Sciences and technics (sem)		15h+15h	2 Credits	q2	x	x
LSC2001	Introduction to contemporary philosophy	Peter Verdée	30h	2 Credits	q2	x	x
LSC2220	Philosophy of science	Peter Verdée (compensates Alexandre Guay)	30h	2 Credits	q2	x	x

Optional courses :

These credits are not counted within the 120 required credits.

LSST1001	IngénieuxSud	Jean-Pierre Raskin	15h+45h	5 Credits	q1+q2	x	x
LSST1002M	Information and critical thinking - MOOC	Myriam De Kesel Jim Plumat Jean-François Rees	30h+15h	3 Credits	q2	x	x

PROFESSIONAL FOCUS [30.0]

La finalité spécialisée comprend le mémoire et le cours de base en statistique du biostatisticien.

O Mandatory	⊠ Optional
△ Courses not taught during 2020-2021	⊘ Periodic courses not taught during 2020-2021
⊕ Periodic courses taught during 2020-2021	Activity with requisites

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

Content:

						Year 1	Year 2
O LSTAT2828	memory in biostatistics			25 Credits	q1 or q2		x
O LSTAT2330	Statistics in clinical trials.	Catherine Legrand Annie Robert	22.5h +7.5h	5 Credits	q2	x	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/épidémiologie *[en-prog-2020-bsta2m-bbsta220o]*
> Biométrie, technométrie et bioinformatique *[en-prog-2020-bsta2m-lbsta210o]*

BIOSTATISTIQUE CLINIQUE/ÉPIDÉMIOLOGIE

O Mandatory	⊠ Optional
△ Courses not taught during 2020-2021	⊘ Periodic courses not taught during 2020-2021
⊕ Periodic courses taught during 2020-2021	Activity with requisites

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.

O Content:

O Choisir au moins un cours parmi

						Year 1	Year 2
⊠ WFSP2218	Analyse longitudinale : régression linéaire, logistique et de Poisson	Annie Robert	20h+20h	4 Credits	q1	x	x
⊠ WFSP2228	Revue systématique de la littérature, revue réaliste et méta-analyse	Annie Robert (coord.) Geneviève Van Maele	20h+10h	3 Credits	q2	x	x

⊠ Cours au choix

⊠ WESP2234	Strategy of the medical decision	Andrea Penaloza-Baeza Annie Robert (coord.)	30h	3 Credits	q1	x	x
⊠ WFSP2201	Advanced methods in public health : seminar	Niko Speybroeck	15h	3 Credits	q2	x	x
⊠ WFSP2202	Health survey methods	Stefaan Demarest Lydia Gisle Séverine Henrard Vincent Lorant (coord.)	20h	5 Credits	q1	x	x
⊠ WFARM2196	Rational therapeutic choices (Introduction to evidence-based medicine and pharmacoeconomy)	Nathalie Dujardin Séverine Henrard Anne Spinewine (coord.)	30h+10h	4 Credits	q1	x	x
⊠ WFARM2513	Pharmacocinétique approfondie	Laure Elens	22.5h	3 Credits	q2	x	x

BIOMÉTRIE, TECHNOMÉTRIE ET BIOINFORMATIQUE

O Mandatory	⊠ Optional
△ Courses not taught during 2020-2021	⊘ Periodic courses not taught during 2020-2021
⊕ Periodic courses taught during 2020-2021	Activity with requisites

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.

O Content:

O Choisir au moins un cours parmi

						Year 1	Year 2
⊠ LBRTI2101A	Data Science in bioscience engineering	Patrick Bogaert Emmanuel Hanert	22.5h +15h	3 Credits	q1	x	x
⊠ LSTAT2310	Statistical quality control.	Bernard Francq	15h+5h	4 Credits	q1	x	x

⊠ Cours bioinformatique au choix

⊠ LGBIO2010	Bioinformatics	Pierre Dupont	30h+30h	5 Credits	q1	x	x
⊠ LINGI2262	Machine Learning :classification and evaluation	Pierre Dupont	30h+30h	5 Credits	q2	x	x

⊠ Cours bioinformatique : maximum 1 cours parmi

⊠ LBRAI2220A	Génétique quantitative, amélioration et biotechnologies végétales	Pierre Bertin Xavier Draye	30h	3 Credits	q2	x	x
⊠ LBRMC2201	Bioinformatics : DNA and protein sequences	Michel Ghislain	30h+15h	4 Credits	q1	x	x
⊠ WESP2232	Epidémiologie génomique	Catherine Legrand Alexandre Persu Annie Robert (coord.) Miikka Vikkula	15h+15h	3 Credits	q2	x	x

⊠ Cours biométrie : maximum 1 cours parmi

⊠ LBIRA2110B	Applied Econometrics	Xavier Draye Frédéric Gaspart Bernadette Govaerts	27.5h +7.5h	3 Credits	q1	x	x
⊠ LBRAI2222	Compléments de biométrie et plans expérimentaux	Xavier Draye (coord.) Bernadette Govaerts	22.5h +15h	3 Credits	q2	x	x

⊠ Cours de technométrie au choix

⊠ LGBIO2020	Bioinstrumentation	André Mouraux Michel Verleysen	30h+30h	5 Credits	q1	x	x
⊠ LMECA2711	Quality management and control.	Nicolas Bronchart	30h+30h	5 Credits	q2	x	x

⊠ Cours de technométrie : maximum un cours parmi

⊠ LGBIO2050	Medical Imaging	Greet Kerckhofs John Lee Benoît Macq Frank Peeters	30h+30h	5 Credits	q1	x	x
⊠ WSBIM2243	Digital processing of medical images	Benoît Macq	30h+15h	4 Credits	q2	x	x

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 puposes 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:

- transform a prerequisite into a corequisite within the same year (to enable the student to continue his or her studies with a sufficient annual course load)
- require the student to combine registration in two separate CUs which it considers necessary from a pedagogical point of view.

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

 # Prerequisities 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 competences expected of every graduate on completion of the programme. You can see the contribution of each teaching unit to the programme's reference framework of learning outcomes in the document *"In which teaching units are the competences and learning outcomes in the programme's reference framework developed and mastered by the student?"*

BSTA2M - 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.

SUMMARY

Specific access requirements

En plus de remplir les conditions d'accès décrites ci-dessous, les candidats devront apporter la preuve d'une maîtrise suffisante de la langue française (niveau B1 du Cadre européen commun de référence) .

University Bachelors

Diploma	Special Requirements	Access	Remarks
UCLouvain Bachelors			
Bachelor in Bioengineering		Direct access	
Bachelor in Biology Bachelor in Biomedicine Bachelor in Medecine Bachelor in Pharmacy Bachelor in Dentistry Bachelor in Motor skills : General Bachelor in Physiotherapy and Rehabilitation	Supplementary classes: LSTAT2011, LSTAT2012, LSTAT2013.	Access based on application	
Bachelor : Business Engineering Bachelor in Economics and Management Bachelor in Engineering Bachelor in Computer Science Bachelor in Mathematics Bachelor in Physics	Supplementary classes: LBIO1110, LBIO1111 ou LIEPR1004A	Access based on application	
Tous les bacheliers	If student has succeeded Minor in Statistics, Actuarial Sciences and Data Sciences and LBIO1110, LBIO1111, LIEPR1004.	Direct access	In some cases, the UCLouvain Enrolment Office, after reviewing their online enrolment or re-enrolment application, will ask the students concerned to provide an enrolment authorisation from the faculty/ school.
Tous les autres bacheliers	if the student did not succeed Minor in Statistics, Actuarial Sciences and Data Sciences and LFSAB1221	Access based on application	

	Supplementary classes: - LBIO1110, LBIO1111 or LIEPR1004A - and/or LSTAT2011, LSTAT2012, LSTAT2013	
Others Bachelors of the French speaking Community of Belgium		
Bachelier en sciences de l'ingénieur, orientation bioingénieur		Direct access
Bachelier en sciences biologiques Bachelier en sciences biomédicales Bachelier en sciences de l'ingénieur, orientation bioingénieur	Supplementary classes: LSTAT2011, LSTAT2012, LSTAT2013	Access based on application
Bachelier en ingénieur de gestion Bachelier en sciences économiques et de gestion Bachelier en sciences de l'ingénieur, orientation ingénieur civil Bachelier en sciences informatiques Bachelier en sciences mathématiques Bachelier en sciences physiques	Supplementary classes: LBIO1110, LBIO1111 ou LIEPR1004A	Access based on application
Tout autre bachelier	Supplementary classes: - LBIO1110, LBIO1111 or LIEPR1004A - and/or LSTAT2011, LSTAT2012, LSTAT2013	Access based on application
Bachelors of the Dutch speaking Community of Belgium		
Bachelier en sciences de l'ingénieur, orientation bioingénieur		Direct access
Bachelier en sciences biologiques Bachelier en sciences biomédicales Bachelier en sciences de l'ingénieur, orientation bioingénieur	Supplementary classes: LSTAT2011, LSTAT2012, LSTAT2013	Access based on application
Bachelier en ingénieur de gestion Bachelier en sciences économiques et de gestion Bachelier en sciences de l'ingénieur, orientation ingénieur civil Bachelier en sciences informatiques Bachelier en sciences mathématiques Bachelier en sciences physiques	Supplementary classes: LBIO1110, LBIO1111 ou LIEPR1004A	Access based on application
Tous les autres bacheliers	Supplementary classes: - LBIO1110, LBIO1111 or LIEPR1004A - and/or LSTAT2011, LSTAT2012, LSTAT2013	Access based on application
Foreign Bachelors		
Tous les bacheliers	Supplementary classes: - LBIO1110, LBIO1111 or LIEPR1004A	Access based on application

	- and/or LSTAT2011, LSTAT2012, LSTAT2013

Non university Bachelors

> Find out more about links (https://uclouvain.be/fr/etudier/passerelles) to the university

Diploma	Access	Remarks
BA - technologue de laboratoire médical - HE - crédits supplémentaires entre 45 et 60 BA en agronomie (techniques et gestion agricoles) - EPS - crédits supplémentaires entre 45 et 60 BA en agronomie (toutes orientations) - HE - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (automatique) - EPS - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (automatique) - HE - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (gestion technique des bâtiments - domotique) - HE - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (informatique industrielle) - EPS - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (informatique industrielle) - HE - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (réseaux et télécommunications) - EPS - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (réseaux et télécommunications) - HE - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (sécurité des systèmes) - HE - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (sécurité des systèmes) - EPS - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (technologie de l'informatique) - EPS - crédits supplémentaires entre 45 et 60 BA en informatique et systèmes (technologie de l'informatique) - HE - crédits supplémentaires entre 45 et 60	Les enseignements supplémentaires éventuels peuvent être consultés dans le module complémentaire.	Type court

Holders of a 2nd cycle University degree

Diploma	Special Requirements	Access	Remarks
"Licenciés"			
Licenciés belges de la communauté française: Bioingénieur Ingénieur civil (sauf ingénieur civil architecte) sciences mathématiques	LBIO1110, LBIO1111 or LIEPR1004A is supplementary classes for students who have not taken an equivalent course.	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.
Ingénieur de gestion Sciences biologiques Siences biomédicales Bioingénieur Ingénieur civil (sauf Ingénieur civil architecte) Sciences informatiques Sciences physiques Sciences mathématiques	LSTAT2011, LSTAT2012 and LSTAT2013 are supplementary classes for students who have not taken an equivalent course.	Access based on application	
Tous les autres licenciés	LBIO1110, LBIO1111 or LIEPR1004A is supplementary classes for students who have not taken an equivalent course. LSTAT2011, LSTAT2012, LSTAT2013 are supplementary classes for students who have not taken an equivalent course.	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	LBIO1110, LBIO1111 or LIEPR1004A is supplementary classes for students who have not taken an equivalent course.	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	LSTAT2011, LSTAT2012, LSTAT2013 are supplementary classes for students who have not taken an equivalent course.	Access based on application	
Tous les autres masters	LBIO1110, LBIO1111 ou LIEPR1004A is supplementary classes for students who have not taken an equivalent course. LSTAT2011, LSTAT2012, LSTAT2013 are supplementary classes for students who have not taken an equivalent course.	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

> See the website Valorisation des acquis de l'expérience

It is possible to gain admission to all masters courses via the validation of professional experience procedure.

Access based on application

Reminder : all Masters (apart from Advanced Masters) are also accessible on file.

Foreign students who have succeeded an university education (minimum 3 years) with strong quantitative connotation and who have obtained at least 60% (or 12/20) of average for all successful university years in their home university, 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.

Supplementary classes

To access this Master, students must have a good command of certain subjects. If this is not the case, they must add supplementary classes at the beginning of their Master's programme in order to obtain the prerequisites for these studies.

The complementary module to the Master's degree in Statistics, Biostatistics Orientation aims to prepare a student who does not have the required knowledge of probability calculation and statistics, mathematics, computer science, biology and English to undertake the studies of the Master's degree in Statistics, Biostatistics Orientation. The proposed activities include theoretical teaching units, exercise sessions and practical exercises.

This additional module is intended for all students whose admission is not direct (see the Master's admission requirements). A study advisor will inform the student of the list of SUs to be followed and this list will be approved by the jury.

O Mandatory	⊠ Optional
△ Courses not taught during 2020-2021	⊘ Periodic courses not taught during 2020-2021
⊕ Periodic courses taught during 2020-2021	Activity with requisites

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

Maximum 60 credits

⊠ Bloc intégré de probabilité, statistique et mathématique

O LSTAT2011	Éléments de mathématiques pour la statistique	Catherine Legrand	15h+15h	3 Credits	q1
O LSTAT2012	Probabilités: Concepts de base pour l'analyse statistique	Eugen Pircalabelu	15h+15h	3 Credits	q1
O LSTAT2013	Concepts de base en statistique inférentielle	Eugen Pircalabelu	15h+15h	3 Credits	q1

⊠ Cours de mathématiques

⊠ LBIR1110	Introduction to analysis	Emmanuel Hanert	30h+30h	6 Credits	q1
⊠ LMAT1101	Mathematics 1	Pedro Dos Santos Santana Forte Vaz	30h+20h	4 Credits	q1
⊠ LMAT1102	Mathematics 2	Augusto Ponce	30h+30h	4 Credits	q2
⊠ LINGE1114	Mathematics I: analysis	Heiner Olbermann	30h+30h	5 Credits	q1
⊠ LINGE1121	Mathematics II: algebra and matrix calculus	Tom Claeys	30h+30h	5 Credits	q2

⊠ Cours d'informatique

⊠ LINGE1225	Programming in Economics and Management	Marco Saerens	22.5h+22.5h	4 Credits	q1

⊠ Cours de la spécialité

⊠ LBIO1110	Life : diversity and evolution	Patrick Dumont Thierry Hance Caroline Nieberding (coord.)	30h+10h	4 Credits	q1
⊠ LBIO1114	Introduction to biology	Patrick Dumont Caroline Nieberding	30h+7.5h	3 Credits	q2
⊠ LBIO1111	Cell and molecular biology	André Lejeune	30h+20h	5 Credits	q1
⊠ LIEPR1004A	Biologie cellulaire et éléments d'histologie (partim A FSA)		45h	4 Credits	q2
⊠ LPSP1005	General biology, including elements of human genetics	André Moens	30h	4 Credits	q1
⊠ WMD1102	Physique expérimentale et introduction mathématique aux sciences expérimentales (1e partie)	Eduardo Cortina Gil	60h+21h	8 Credits	q1
⊠ WMDS1113	Epidémiologie, santé publique et soins de santé	Benoit Boland Jean Macq (coord.) Andrea Penaloza-Baeza	30h+20h	4 Credits	q2

⊠ Cours de probabilités et statistique

⊠ LBIR1212	Probabilities and statistics (I)	Patrick Bogaert	30h+15h	4 Credits	q1
⊠ LBIR1315	Probability and statistics II	Patrick Bogaert	22.5h+22.5h	3 Credits	q1

⊠ LINGE1222	Multivariate Statistical Analysis	Nathan Uyttendaele (compensates Johan Segers)	30h+15h	4 Credits	q2
⊠ LPSP1209	Statistics, inference on one or two variables	Bernadette Govaerts	22.5h+15h	4 Credits	q1
⊠ LPSP1306	Statistics: descriptive analysis and GLM multivariate data modeling	Nathalie Lefèvre Cédric Taverne	30h+15h	4 Credits	q2
⊠ LMAFY1101	Data exploration and introduction to statiscal inference	Anouar El Ghouch	30h+30h	5 Credits	q2
⊠ LBIO1283	Statistical principles and biological data analysis	Nicolas Schtickzelle	30h+40h	4 Credits	q2

⊠ Cours d'anglais (3 credits)

⊠ LANGL1330	English intermediate level - 1st part	Stéphanie Brabant Estelle Dagneaux Aurélie Deneumoustier Fanny Desterbecq Marie Duelz Amandine Dumont Jérémie Dupal (compensates Anne-Julie Toubeau) Carlo Lefevre Sandrine Mulkers (coord.) Marc Piwnik (coord.) Nevin Serbest Françoise Stas	20h	3 Credits	q1 or q2
⊠ LANGL1853	English: Reading Comprehension	Estelle Dagneaux (coord.) Anne-Julie Toubeau	30h	3 Credits	q2

Teaching method

Most of the teaching units applied statistics methods & tools include practical work on computers and an application project involved in the evaluation. This approach allows the student to systematically implement the tools presented in the methodological presentations and thus be prepared for field work. The implementation of projects also fosters a stimulating and friendly spirit of collaboration among the students in the program. The program offers the possibility of an internship in a company or in a research laboratory that will eventually complete the methodological aspects of the thesis. Most of the teaching units provided by statistical teachers are available on moodle or on the LSBA website. Some specialized teaching units are given by professors from companies and/or in English in order to familiarize the student with this language commonly used in the field of statistics.

Evaluation

The evaluation methods comply with the regulations concerning studies and exams (https://uclouvain.be/fr/decouvrir/rgee.html). More detailed explanation of the modalities specific to each learning unit are available on their description sheets under the heading "Learning outcomes evaluation method".

Each course in the programme involves an oral or written examination. There may also be a project leading to a report which will form part of the assessment. The work placement (or work involving statistical application) and the dissertation both involve the production of a document to be defended in an oral examination with an examination board.

Mobility and/or Internationalisation outlook

Students who have achieved outstanding results in the first annual block will be allowed to participate in international exchange programs organized by the LSBA. Currently, bilateral exchange agreements are being established with the Ecole Nationale de la Statistique et de l'Analyse de l'Information (ENSAI, Rennes, France), the University of Dortmund (Germany) and the University of Bologna (Italy).

Students interested in participating in an international exchange program are invited to contact the person responsible for them in the Faculty of Science or the contact person in the LSBA.

Detailled information on https://uclouvain.be/fr/facultes/sc/programmes-d-echange-d-etudiants.html (https://uclouvain.be/fr/facultes/sc/programmes-d-echange-d-etudiants.html)

Contacts

Curriculum Management

Entity

Structure entity	SST/SC/LSBA
Denomination	(LSBA)
Faculty	Faculty of Science (SC)
Sector	Sciences and Technology (SST)
Acronym	LSBA
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