UCLouvain

STAT2M

*2024 - 2025*

# Master [120] in Statistics: General

**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 : **NO**
Main study domain : **Sciences**
Organized by: **Faculty of Science (SC)**
Programme acronym: **STAT2M**

# STAT2M - 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 and to the main technical tools and software for the analysis of statistical data.
- The choice between a focus on research or oriented towards a field of applications.
- 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;
- 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 working in the field of applied data analysis and you wish to provide an academic framework for your practice.

### Your programme

The program of Master's degree in Statistics is composed of a core study program of 64 to 72 credits of courses (UE) and 30 credits (including the Master's thesis) of professional focus (*finalité spécialisée*). You will complete your programs with courses from the proposed options of the programs.

The "Fundamentals" option is an initiation to fundamental or applied research in statistics, but also gives access to the professional life.

The "Statistics in Action" option is oriented towards applied statistics and aims to provide you with the main tools for statistical data analysis.

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 des statistiques qu'il rencontrera dans sa profession, en respectant les contraintes imposées par le contexte.

4. S'il choisit l'option "Fundamentals", maitriser plusieurs domaines de la probabilité ou statistique actuelle et ses problématiques.

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

Démontrer des résultats classiques et plus avancés de probabilité et statistique mathématique.

4.4

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

4.5

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

5. S'il choisit l'option "Statistics in Action", gérer un projet de consultation statistique.

5.1

Communiquer avec un client d'une autre discipline, 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 client et y apporter des réponses adéquates, originales, documentées en l'invitant à l'autonomie.

5.3

Gérer de grandes bases de données.

5.4

Planifier et gérer un projet de consultation statistique.

5.5

Ecrire un rapport clair, succinct et rigoureux d'un projet de consultation statistique.

5.6

Expliquer les résultats d'un projet de consultation statistique aux clients 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.

## STAT2M Programme

## CORE COURSES

- 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...)

### Cours obligatoires de statistique (32 credits)

| | | | | Year 1 | Year 2 |
|---|---|---|---|---|---|
| LSTAT2020 | Statistical softwares and basic statistical programming | Céline Bugli | FR [q1] [15h+15h] [4 Credits] | x | |
| LSTAT2190 | Concepts and treatment of random vectors | Rainer von Sachs | FR [q1] [15h+7.5h] [4 Credits] | x | |
| LSTAT2100 | Discrete data analysis. | Anouar El Ghouch | FR [q2] [30h+7.5h] [5 Credits] | x | |
| LSTAT2110 | Data Analysis | Benjamin Colling | FR [q1] [30h+7.5h] [5 Credits] | x | |
| LSTAT2120 | Linear models | Christian Hafner | EN [q1] [30h+7.5h] [5 Credits] > *French-friendly* | x | |
| LSTAT2130 | Introduction to Bayesian statistics | Philippe Lambert | EN [q2] [22.5h+7.5h] [5 Credits] | x | |
| LSTAT2140 | Non parametric statistics | Eugen Pircalabelu | FR [q1] [15h+5h] [4 Credits] | x | x |

| | | | | Year 1 | 2 |
|---|---|---|---|---|---|
| LFILO2003E | Ethics in the Sciences and technics (sem) | | [q2] [15h+15h] [2 Credits] | x | x |
| LSC2001 | | Peter Verdée<br>Peter Verdée<br>(compensatesIntroduct 0 cm 0 0 m 8.503 0 l 7.503 1 l 1 1 l h W n 1 G [ 1 l 1 1 0.9 | | | |

# STATISTICS IN ACTION

- 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
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- 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...)

## Content:

| | | | | Year 1 | Year 2 |
|---|---|---|---|---|---|
| LSTAT2390 | Applied statistics workshops | Christian Ritter<br>Laura Symul | EN [q1+q2] [15h] [3 Credits]<br>*> French-friendly* | | x |

## Stage ou travail d'application

| | |
|---|---|
| LSTAT2920 | Stage ou travail d'application |

## Supplementary classes

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

O 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 0 to 60credit(s)*

## ⊠ Cours d'anglais

| | | | |
|---|---|---|---|
| ⊠ LANGL1330 | English intermediate level - 1st part | Stéphanie Brabant<br>Charline Coduti (compensates Anne-Julie Toubeau)<br>Estelle Dagneaux<br>Jean-Luc Delghust<br>Aurélie Deneumoustier<br>Fanny Desterbecq<br>Marie Duelz<br>Claudine Grommersch<br>Sandrine Mulkers (coord.)<br>Yannick Paquin (compensates Anne-Julie Toubeau)<br>Marc Piwnik (coord.)<br>Françoise Stas | EN [q1 or q2] [20h] [3 Credits] |

# 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**

| | | | |
|---|---|---|---|
| | | | 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, supplementary classes: LSTAT2011, LSTAT2014 or LMAT1271 | Access based on application | |
| **Others Bachelors of the French speaking Community of Belgium** | | | |
| Bachelier en sciences de l'ingénieur, orientation bioingénieur<br>Bachelier en sciences de l'ingénieur, orientation ingénieur civil<br>Bachelier : ingénieur de gestion<br>Bachelier en sciences informatiques<br>Bachelier en sciences physiques | | Direct access | |
| Tout bachelier | Supplementary classes: LSTAT2011, LSTAT2014 or LMAT1271 | Access based on application | |
| **Bachelors of the Dutch speaking Community of Belgium** | | | |
| Bachelor of Science in de bio-ingenieurswetenschappen<br>Bachelor of Science in de toegepaste economische wetenschappen: handelsingenieur<br>Bachelor of Science in de toegepaste economische wetenschappen<br>Bachelor of Science in de ingenieurswetenschappen<br>Bachelor of Science in de informatica<br>Bachelor of Science in de wiskunde<br>Bachelor of Science in de fysica | | Direct access | |
| Tous les autres bacheliers | Supplementary classes: LSTAT2011, LSTAT2014 or LMAT1271 | Access based on application | |
| **Foreign Bachelors** | | | |
| Tous les bacheliers | Supplementary classes: LSTAT2011, LSTAT2014 or LMAT1271 | Access based on application | |

## Non university Bachelors

> Find out more about links to the university

## Holders of a 2nd cycle University degree

| Diploma | Special Requirements | Access | Remarks |
|---|---|---|---|
| **"Licenciés"** | | | |
| Ingénieur civil (sauf ingénieur civil architecte)<br>Sciences informatiques<br>Sciences économiques<br>Sciences de gestion<br>Ingénieur de gestion<br>Sciences actuarielles<br>Sciences physiques<br>Sciences mathématiques<br>Bioingénieur | | 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 Statistics in a single year. |
| Toutes les autres licences | | 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 Statistics in a single year. |
| **Masters** | | | |

## Evaluation

***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".***